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2. Mikrobiologicky Ustav AV CR V.V.I (IMIC)
3. Forfarmers Corporate Services BV (FF)
4. Instituto de Biologia Experimental e Tecnológica (IBET)
5. International Flavors and Fragrances IFF (Nederland) BV (IFF)
6. Laboratorio Nacional de Energia e Geologia I.P. (LNEG)
7. Phycom BV (PHY)
8. Upfield Research and Development B.V. (UPF)

MULTI-STR3AM

A sustainable multi-strain, multi-method, multi-product microalgae biorefinery integrating industrial side streams to create high-value products for food, feed and fragrance

BBI-2019-SO1-D2 - Produce components for various materials, including for food and feed, from microalgae

Collaborative project

Start date of the project: 01/05/2020

Duration: 60 months

Deliverable 6.11

Report on participation in knowledge-sharing events for year 3

WP	6	Communication and dissemination
Task	6.4	Organisation of and participation in knowledge sharing events (M1-M48)

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Lead beneficiary	A4F
Contributing beneficiaries	IMIC, FF, IBET, IFF NL, LNEG, PHY, UpF

¹ Dissemination level: **PU** = Public, **CO** = Confidential, only for members of the consortium (including the BBI), **CI** = Classified, information as referred to in Commission Decision 2001/844/EC.

² Nature of the deliverable: **R**: Document, report (excluding the periodic and final reports), **DEM**: Demonstrator, pilot, prototype, plan designs, **DEC**: Websites, patents filing, press & media actions, videos, etc., **OTHER**: Software, technical diagram, etc.

WP 6:	A4F	Author
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Deliverable abstract

This deliverable refers to all knowledge-sharing events, such as networking events, industry salons and conferences, for year 3, to disseminate results and gain relevant knowledge.

This deliverable is part of Task 6.4, on the “Organisation of and participation in knowledge sharing events”. The goal is twofold: to promote the project results and contribute to the awareness of potential of microalgae as a source of food and feed ingredients as well as high-value compounds.

The third year (M25-M36) was defined by the dissemination plan as the first part of the dissemination development phase. The main objective was to increase visibility, mostly through communication activities: conferences, articles, press releases, website and other social media avenues; with the participation of all partners.

The consortium was able to take part in 76 dissemination and communication activities during M25-M36.

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2. Dissemination and Communication Activities

The MULTI-STR3AM consortium is concerned to give fair publicity to the project and its innovative applications, in favour of the dissemination of scientific and technological knowledge and communicate with policy makers and consumers about characteristics and advantages of these new products.

The deliveries on Dissemination Plan (D6.1, D6.8) and Communication Plan (D6.2, D6.9) detail the overall goals of these activities, important stakeholders and key messages to address, besides the performance indicators (KPIs).

Objectives of the second year

The third year (M25-M36) was defined by the dissemination development phase. This phase of the dissemination plan has as main goal to sustain and increase visibility and engagement of the target groups defined. This phase has been implemented by each partner and the consortium alike, investing on disseminating the project's results in conferences, articles, press releases, website and social media.

In terms of dissemination, the project partners will benefit from the awareness raised through communication activities to identify any low hanging fruits that can later benefit dissemination efforts.

3. Activities carried out for the period M25-M36 (May 2022-April 2023)

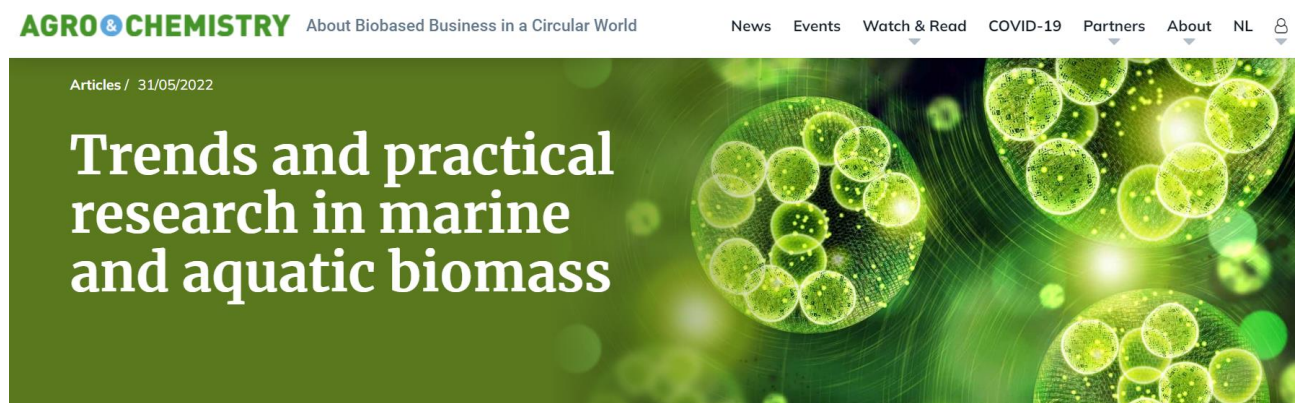
In total, 76 activities were identified by the MULTI-STR3AM consortium during May 2022 and April 2023 (but also counting activities of year 2 that were not reported previously). In this section, all these activities will be briefly described according to the different means of dissemination.

Number of persons reached was estimated per each activity, and classified among scientific community, industry representatives, general public, policy makers, media, investors and customers.

3.1 Non-scientific and non-peer-reviewed publication (popularised publication)

Non-scientific publications target mostly the general public, industry and policy makers. For media coverage, articles with a general description of the project have been prepared for publications in outlets such as specialised blogs, national and regional newspapers.

3.1.1 Mention to the MULTI-STR3AM @ Article “Trends and practical research in marine and aquatic biomass” of Agro & Chemistry



Greener materials

Sustainability regulations are one of the drivers for the initiators of the BBI-funded [Multi-Str3am demonstration project](#) to develop a concept for producing greener materials. Alternatives must be sought for microplastics or substances that are harmful to the environment, for example. Consumers are also asking for this.

The industry must therefore look for new raw materials and building blocks for more sustainable products. This offers opportunities for algae biomass, yet this source remains underused. “This is mainly because algae biomass is not yet available on a commodity scale and is therefore relatively expensive for the time being,” explains Luis Costa of [Algae4Future \(A4F\)](#), one of the eight consortium partners in the project.



Luis Costa

“The Multi-Str3am project aims to remove the barriers. Firstly, by improving multiple strains of algae to increase productivity and better match the demands of end users. Then, we will look at improving the efficiency of cultivation and harvesting technologies, the opportunities for using side streams from industry (and our own production) during cultivation, combining technologies and valorising all fractions of the biomass (a zero waste approach).” The result should be a sustainable, multi-strain, multi-method and multi-product microalgae biorefinery that integrates industrial side streams to make high value products for food, feed and fragrance.

Partner	Date	Online/ Offline	Means of verification, References & Links
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A4F	31 st May 2022	Online	https://www.agro-chemistry.com/articles/trends-and-practical-research-in-marine-and-aquatic-biomass/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	Unknown
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3.1.2. Mention to the MULTI-STR3AM @ For Farmers Annual Report – External Organisations

Name	Country	Specification	FF employee name	Board, committee, task force, working group name
Miscellaneous				
Ministry Economic Affairs	Netherlands	Ministry for Economy Affairs	Manfred Hessing	Stakeholders consultative Group Animal Feed
Ketenborging.nl	Netherlands	Foundation ketenborging.nl	Manfred Hessing	Steering group ketenborging.nl
Poultry sector	Netherlands	Poultry chain platform	Manfred Hessing	Steering group Poultry chain
Pig Health & Welfare Council	UK	Industry Working Group	Nick Major	AMR Sub Group
Pig Scholarship Scheme	UK	Industry Working Group	Tom Welham	Steering Committee
IFF	Germany	Internationale Forschungsgemeinschaft Futtermitteltechnik	Marcel Kekstadt	Junge IFF
Red Tractor Poultry Scheme	UK	Quality Standards for poultry production	Ade Adebisi	Technical Advisory Committee
RUN4LIFE	Europe	Research Project - Wastewater treatment and resource recovery	Ad van Wesel	Steering Group
SUSINCHAIN	Europe	Research Project - Increasing the use of the insect protein value chain	Ad van Wesel	Steering Group
Multistr3am	Europe	"Research Project - microalgae biorefinery integrating industrial sidestreams to create high-value products for food, feed and fragrance"	Nick Major	Steering Group
LUW Sounding Board	Netherlands	Agri sector group looking at primary production	Ad van Wesel	Sounding Board
Logistics UK	UK	UK Transport Sector - compliance & support	Ian Stewart/Terry Morrison	Policy & advice
GAFTA	UK	GAFTA Raw materials committee	Stefan Benfield	Raw Materials Committee
Worshipful Company of Farmers	UK	Livery Company	Nick Major	Steering Group [Court]

Partner	Date	Online/ Offline	Means of verification, References & Links
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FF	23 rd February 2023	Online	FORFARMERS - External organisations.pdf (forfarmersgroup.eu)
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	Unknown
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3.1.3. Mention to the MULTI-STR3AM @ ECHO, 3/4/2022, p. 27-29 - From photosynthesis to inflammation treatment - microalgal research in Trebon

DALŠÍ VÝZNAMNÉ PROJEKTY MBÚ AV ČR – CENTRA ALGATECH

PROJEKT MULTISTR3AM: Mikrobiologický ústav AV ČR – Centrum ALGATECH se podílí na evropském projektu MULTISTR3AM, který reaguje na rostoucí poptávku po udržitelných produktech z mikrořas ze strany velkých koncových producentů potravin, krmiv a kosmetiky. Důraz se klade na zvýšení produkce a snížení ceny kultivace mikrořas a na dlouhodobou udržitelnost. V popředí zájmu jsou především tuky, které by mohly nahradit palmový olej biotechnologickou cestou, dále bílkoviny, cukry, lipidy a antioxidanty pro využití v chovech drůbeže, prasat a přežvýkavců a konečně nízkomolekulární látky produkované mikrořasami, které by mohly najít uplatnění v kosmetice, především v udržení parfémů a aktivních složek v konečném kosmetickém produktu. V projektu jsou partnersky zahrnuty výzkumné instituce, firmy produkující řasovou biomasu i koneční odběratelé, kteří patří k největším na světě. Potravinářský sektor zastupuje společnost Upfield, krmiváře firma ForFarmers a kosmetický průmysl je-

voani hospodářství, který oacnovava ryby pro jezera v Soimonraasku a společnost BEST, jejímž úkolem je navrhnout způsob využití odpadních živin z jiných zemědělských podniků, například digestát po výrobě bioplynu. Úlohou Mikrobiologického ústavu je vyvinout nový automatizovaný kultivátor mikrořas a vyhledat řasy, které budou produkovat potřebné cenné látky a jejichž kultivace je co nejlevnější a nejjednodušší. Samozřejmou podmínkou je, že řasy budou dobře přijímány vířníky.

PROJEKT ALGAE4IBD: IBD (Inflammatory Bowel Disease) je skupina idiopatických zánětlivých onemocnění spojených s dysregulací trávicího systému. Dochází díky tomu k poškození a dysfunkcím vnitřních orgánů jako žaludek, střeva a dalších částí trávicího systému. Silné bolesti žaludku, chronický průjem, ulceritidy, krvácení do trávicího traktu a v některých případech i rakovina střeva – to vše jsou následky těchto zánětlivých onemocnění.

Projekt Algae4IBD je financován programem Horizont 2020. Snahou projektu je získat přírodní látku původem z řas, která by vykazovala aktivitu vůči IBD (ať už ve formě léčby, prevence rozvinutí negativních důsledků IBD, ale i zmírnění zánětlivých projevů onemocnění). Do projektu jsou zapojeni odborníci na růst řas a jejich produkci, technologové, gastroenterologové, specialisté na vývoj funkčních doplňků stravy a farma na pěstování řas.

Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	1 st July 2022	Online	https://www.horizontevropa.cz/files_public/elfinder/2893/echo_3_4_2022.pdf					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown							

3.1.4. Article "Health coloured to green" in official bulletin of the Czech Academy of Sciences - Science and Research by IMIC

o sklizení zeleného rybníka, ale o hládku kofule jedné orgánismu, jednoho kmeny, "vyrábějícího bílý Richard Lhotský. Podle jeho názoru existují dvě cesty. První je, že se budou hledat látky, které jsou natolik cenově, že jejich relativně vysoká cena nebude na překážku. Typický je o kávu, různé druhy dopravy, kožené líčky s kerolín, biologické prostředky na ochranu ovocí a podobně. Druhá cesta je vytvořit náklady pěstování, což lze vyřešit různě "odpovědi" odjezdu - živiny, což je sádky, teplo, kyslík, vzduchová imitace se úroveň pracoviště vydrží i třetí, neproduktivní a dlouhou cestou je je výtoku v oblasti molekularní genetiky a syntetické biologie. Tento

směr je vhodný i pro tradiční zemědělství. Mohli bychom tedy mikrořasy nazvat "superpocuváči"? Kvalita epse minit Richard Lhotský: „V přírodních spárkách a výtoku dělá v různých oblastech trojí bytí srovnání s superpotravou používá, ale jinak je nečistým propagačním le-takům.“ Vůči by rodějí termín „funkční potraviny“ tedy potraviny nebo spíše je-lich součástí, které nemají pouze přízní-

PRO ZDRAVÍ I PRO KRÁSU
Rasy mají poměrně mnohoznačné využití i v dalších oblastech prospěšných pro člověka. V kosmetice se většinou používají methanoly – například do pleťových krémů. Adiposé rasy jsou produkty hojně získávají, vešle účinků proti oděratí pletí mají také účinky bělicí. Příměsí se se řasy využívají k doplňování vitamínů vod. Vzniká dokonce se zok dá-živimkov v zombodělní jako řasový s výsokým obsahem fosforu nebo jako přírodní zdroj vitamínů B12 pro chit rostlin či bioplasticů. V cirkulární ekonomice jsou řasy zejména zajímavé pro výrobu bioplastů. Hojně se také využívají vyvíjí se jako zdroj bioplastů, která ale zatím brání vysoké cena.

vě matiční parametry, ale obávají líč-ky, jež cíleně působí na zdraví člověka. Keč není o tabletách, ale o skutečných potravinách. Třeba čerj obiloviny s umar-tyvcovními složkami kyseliny a mláče-fas, například DHA či EPA, nebo denní pečivo s přísadkou křivozín z mikrořas. Ale na výskum nepatří mikrořasy v zá-m-čí Evropské unie není tradiční produkty určené k výživě. Jejich využití tak spadá pod lázeňové potraviny svého typu, které podléhají schválení.

DO MISEK I KORYTEK
Mikrořasy mohou poskytnout nejen lidé, ale také zvířata. Přicházejí se do kr-miv pro zlepení zdravotního stavu hospodářských zvířat, třeba drůbeže nebo prasat. Mají pozitivní vliv na reprodukci, proto bývají součástí krmiv pro psy. Ka-rotenoidy v nich obsažené snižují hmotu masa u lososovitých ryb a korydů nebo zbarvení šupin u okrasných a akvarijních ryb. To samé platí o mořské, výskumy o-sah karotenů "čerpáje" hmotu vaječných žloutků. „Na našem pracovišti jsme pro-kazali jejich pozování více jako náhrady pletí v chovu škeblí. V chovu navíc podpa-ruje dlouhověkost zinné generace včel o působí proti bakteriím včelího mozu,“ doplňuje Ondřej Prátl. Mikrořasné krmí-vo pro včely s přísadkou mikrořas pro přídavnou složku chováni pseni a snouzi vložili toto krmivo již používají.

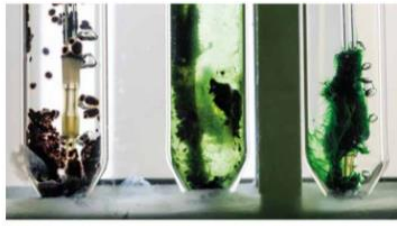
V Centru AlgaeTech se aktuálně pracuje na přeshraničním projektu AlgaeTribal z programu Interreg AT-CZ, který se vě-nuje odvozu kandida obsaženého. Řešení vychází z přirozeného potřeby řešitne plnění kandidá. Jeho přínosem potra-

vou je zooplankton, tedy mikrookopití vodu žijícího, a ti se zase živí mik-rořasami. Žijící plůčka je tedy vhodná zvládnout dříve mikrořas. a zooplankto-nu možná snížit zbytek počet přetvo-řečích včelk, čímž jeví zdravost živo-tů, sníží počet obilovin srovnání. Věd-řím se v tomto ohledu velmi rád.

Ou většekého výsledku se skuteč-ně mu využívá v psaní je poměrně dlouhá cesta. Centrum AlgaeTech však neza-šíl a šliti se své "aktivní" nejen chlebu, ale ike včasnoste urodivodní uper-ky. Hlavní věcí například zkoumá vyvíjí specializované řas mluhých ox-tyemal posílají pro získání prvok více-tych aminů a vitamínů vod. Zaměřili se také na využití odpadních látek, zle-řování cizích látek pro medicínu nebo šlechtění a nové metody odvozu usouza mikrořas, jim ovšem vyřet nečistoty. Vě-řím vyhodnocení biologických aktivit je-řasový biokomplex, specializované ziskné směs karotenoidů z řas, o které má zá-jem výrobce v Čech a Itálii. Podílili jsme se také na výskumu látky na ochranu zeleniny proti houbovým újmám a se-mulantičtá česka pocházející z řas, které se nyní testují ve španělské Andalúzii. S dánskou firmou pracujeme na AlgaeBio-ku mikrořas "vložili pro pokračování" vyvíjí Richard Lhotský občasí, kde vstáde lze tyto mikrořasopití organicky upotřebí.

Obilouk se vracíme zpět kú gastr-onomické tematice. Tazatelé vše jedlé řasy? Dejte se sdu salkovkú na slá-vo vzragné lístky jen marketingovým, nebojte se o zkusit je. Salkové řasy je možné přidat do salátových nálev, se-mimerných polávek, ale i do například dárů či dalších salátků. Tak se říká v-fantazii se může nakládat. V biobádné ninky věří i Ondřej Prátl – každé rano začína s látkou úroveňské řasy chlebaa rozložkou ve sklenici vody.

Centrum AlgaeTech sítí i salko Opatovského regionu a kú hradí sledování se to výskumě "vložili zřelky, o přístrojem soukta podobný uš 1e. stolu. K. konstruovanou: baraní: busno, míra: míra, i: přístroby výroby, kú: nudození: kooperací.



"Na českém trhu jsou typické čokoládové bonbonky čokovitého tvaru s barevnými polevami. Když výrobci hledali přírodní barviva, dlouho nemohli najít onu šmolí modř. Nakonec objevili a používají barvivo fykocyanin ze spiruliny."

Richard Lhotský



Richard Lhotský má v Centru AlgaeTech na starost přímou výsoké výskum, do práce spolupráci s konkrétním sítím.

Partner	Date	Online/ Offline	Means of verification, References & Links
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IMIC	25 th June 2022	Online	http://pdf.avcr.cz/A/2021-02/?fbclid=IwAR3UsZrYR-DJtglGbQwtMtZnnBjHu8173Vj5zRHOGiFkzgirDY7vny1ZMTk#page=72
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	2000			3000	5000			10000

3.1.5. Article on the Weekend newspaper's nationwide magazine "MF Dnes Víkend" by IMIC

Partner	Date	Online/ Offline	Means of verification, References & Links
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IMIC	7 th May 2022	Offline	Impressed magazine
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached			65000					65000

3.2 Scientific and peer-reviewed publications

3.2.1 Publication of a research article by LNEG and A4F @ Fermentation - MDPI



fermentation



Article

Conceptual Design of an Autotrophic Multi-Strain Microalgae-Based Biorefinery: Preliminary Techno-Economic and Life Cycle Assessments

Tiago F. Lopes ^{1,†} , Joana Ortigueira ^{1,†}, Cristina T. Matos ², Luís Costa ² , Cláudia Ribeiro ², Alberto Reis ¹ and Francisco Gírio ^{1,*}

¹ Laboratório Nacional de Energia e Geologia, I.P. (LNEG), Unidade de Bioenergia e Biorrefinarias, Estrada do Paço do Lumiar 22, Edif. F, R/C, 1649-038 Lisbon, Portugal

² A4F—Algae for Future, Campus do Lumiar, Estrada do Paço do Lumiar 22, Edif. E, R/C, 1649-038 Lisbon, Portugal

* Correspondence: francisco.girio@lneg.pt; Tel.: +351-210924600/1

† These authors contributed equally to this work.

Partner	Date	Online/Offline	Means of verification, References & Links
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LNEG and A4F	2 nd March 2023	Online	https://doi.org/10.3390/fermentation9030255
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	433							433

3.2.2 Publication of a research article by IMIC @ Journal of Applied Phycology



[Home](#) > [Journal of Applied Phycology](#) > Article

Published: 01 September 2022

Bio-production of eicosapentaenoic acid from the diatom *Nanofrustulum shiloi* via two-step high performance countercurrent chromatography

[Daniela Bárcenas-Pérez](#), [Martin Lukeš](#), [Pavel Hrouzek](#), [Jakub Zápál](#), [Marek Kuzma](#), [Jiří Kopecký](#), [David Kubáč](#), [Bertha O. Arredondo-Vega](#) & [José Cheel](#)

[Journal of Applied Phycology](#) **34**, 2995–3010 (2022) | [Cite this article](#)

221 Accesses | [Metrics](#)

Partner	Date	Online/Offline	Means of verification, References & Links
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IMIC	1 st September 2022	Online	https://doi.org/10.1007/s10811-022-02816-w
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	221							221
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3.2.3 Publication of a research article by IMIC @ Algal Research





Algal Research
Volume 69, January 2023, 102926



Cold-adapted culturing of the microalga *Monoraphidium* sp. in thin-layer raceway pond for biomass production

[Gergely Ernő Lakatos](#)^a  , [Karolína Ranglová](#)^a, [Daniela Bárcenas-Pérez](#)^{a b}, [Tomáš Grivalský](#)^a, [João Câmara Manoel](#)^{a b}, [Mykola Mylenko](#)^a, [José Cheel](#)^a, [József Nyári](#)^d, [Roland Wirth](#)^{c d}, [Kornél L. Kovács](#)^{d e}, [Jiří Kopecký](#)^a, [Linda Nedbalová](#)^{f g}, [Jiří Masojídek](#)^{a b}

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<https://doi.org/10.1016/j.algal.2022.102926> ↗

Get rights and content ↗

Partner	Date	Online/Offline	Means of verification, References & Links					
IMIC	4 th December 2022	Online	https://doi.org/10.1016/j.algal.2022.102926					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown							

3.3 Participation in activities organised jointly with other EU project(s)

3.3.1 BIC Webinar Marine & Aquatic Biomass - Presentation of MULTI-STR3AM project



WEBINAR

Can marine and aquatic sources feed the bio-based industry? Part 2

AGENDA

- 10:30: Welcome, introduction & setting the scene - *Nelo Emerencia, BIC & Nuno Coelho, A4F*
- 10:35: Industrial application trends for algae biomass - *Tiago Guerra, Algikey*
- 10:50: Sustainable production of microalgae for agriculture-related applications - *Prof. Gabriel Acién, Univ. Almeria*
- 11:05: The Multistream Project - *Luís Costa*
- 11:20: Q&A
- 11:30: End

Partner	Date	Online/Offline	Means of verification, References & Links
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A4F	5 th May 2022	Online	https://mailchi.mp/70c03071db48/lca_sustainability-13870481?e=e87ca133d0
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	Unknown
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3.4 Participation to a Workshop

3.4.1 LNEG participation on the VI Bioenergy Workshop (Brazil)

Lecture by Tiago Lopes entitled "Techno-economic and life cycle assessments of bioenergy systems and biorefineries – methodology and case-studies" where MULTI-STR3AM project was also disseminated.

A⁻ A⁺



UNIVERSIDADE ESTADUAL PAULISTA
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Instituto de Pesquisa em Bioenergia - Câmpus Rio Claro

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VI Workshop de Bioenergia

Home

VI. Workshop de Bioenergia

Data: 27/10/2022

Instituição

Avaliações tecnoeconômicas e de ciclo de vida de sistemas de bioenergia e biorrefinarias – metodologia e estudos de caso

9:00

Palestrante: Tiago Lopes (Laboratório Nacional de Energia e Geologia - Portugal)

Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG	27 th October 2022	Online	https://www.ipben.unesp.br/#!/eventos/vi-workshop-de-bioenergia/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	30							30

3.4.2 LNEG participation on the Algae Biorefinery workshop by the Portuguese Association of Applied Algology (APAA)

Lecture by Tiago Lopes in the Algae Biorefinery workshop by the Portuguese Association of Applied Algology (APAA), where MULTI-STR3AM project was also disseminated.

Associação Portuguesa de Algologia Aplicada (APAA)

BIORREFINARIA DE ALGAS

30 de novembro de 2022 | 14:30 WEST (GMT)



PROGRAMA

15h55 – 16h10 Biorrefinarias à base de microalgas: avaliação técnico-económica e análise de ciclo de vida – Tiago Lopes, LNEG

Partner	Date	Online/Offline	Means of verification, References & Links					
LNEG	30 th November 2022	Online	Programa Webinar 30 novembro 2022.docx - Google Docs					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	30	10	10					50

3.4.3 Presentation of MULTI-STR3Am project @ The EnhanceMicroAlgae Workshop in La Rochelle, France



02

Multi-Str3am
The project

The Project
H2020 BBI - JU
May 2020 – April 2025
Budget € 9,1M.
EU contribution € 6,6 Mi
8 partners (5 companies; 3 RTOs)

MULTI-STR3AM solution will improve the use of microalgal resources with the valorization of all biomass fractions and boost the applications in food, feed and fragrance, contributing to a more bio-based, sustainable, circular economy

Partner	Date	Online/Offline	Means of verification, References & Links					
A4F	20 th October 2022	Offline	The EnhanceMicroAlgae project held an expert workshop on microalgae innovation - CYTMA Blog (anfac.es)					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	17	10						27

3.4.4 Phycom’s Participation in the workshop Texturization: Creating Tasty Plant-Based Food

TPC partner event “Texturization: Creating Tasty Plant-Based Food”

On 15 February 2023 from 14:30 – 17:00 CET, an exclusive The Protein Community (TPC) partner event is organized: “Texturization: Creating Tasty Plant-Based Food”.

Texture is essential for the future of plant-based meat, dairy and fish. To encourage meat-, dairy- and fish-loving consumers to adopt a more plant-based diet, the mouthfeel and texture of plant-based variations must be at least as appealing as those of animal products. In recent years, mouthwatering progress is already made and we can't wait for more. That is why TPC is organising this acceleration session.



Five speakers will share their experience about texturization trends & techniques, such as fermentation and Shear Cell Technology. This event includes a spectacular live demo in High Moisture Extrusion (HME) by Future Foods.


Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	15 th February 2023	Offline	https://theproteincommunity.com/tpc-partner-event-texturization-creating-tasty-plant-based-food/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached		25		25	25			75

3.4.5 Phycom’s Participation in the Nutricia Workshop - Allergen in food and novel food

Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	22 nd March 2023	Offline	-					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	5	5			5			15

3.5 Organisation of a Workshop

3.5.1 Organisation of MULTI-STR3AM workshop at LIMBAC2022



PROGRAM

September, 18th - 23rd

Time	Sunday, 18th	Monday, 19th	Tuesday, 20th	Wednesday, 21st	Thursday, 22nd	
8:15 h		DEPARTURE HOTEL	DEPARTURE HOTEL	DEPARTURE HOTEL	DEPARTURE HOTEL	
8:30 h		ARRIVAL TO CAMPUS		ARRIVAL TO CAMPUS		
9:00 h		REGISTRATION	ARRIVAL TO CAMPUS		ARRIVAL TO CAMPUS	
9:30 h		COURSE INTRODUCTION & PEOPLE PRESENTATION	LAB I - Environmental Microalgae Collection and Isolation <small>Team ALPHA</small>	PILOT PLANT I - Visit to Pilot plant and Harvesting of PBR <small>Team OMEGA</small>	ALGATEC'S SITE VISIT	PILOT PLANT I - Visit to Pilot plant and Harvesting of PBR <small>Team ALPHA</small>
11:00 h		COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	
11:30 h		I - MICROALGAE INDUSTRIALIZATION - Microalgae Biotechnology Industrial Archaeology to Commercial Production <small>Walter Vazquez, A4F</small> - From Cell to Tons <small>Luis Costa, A4F</small> - Design of Microalgae Units & Light Impact <small>Edgar Santos, A4F</small>	LAB II - Tools for Contaminant Detection and Identification LAB III - Heterotrophic Growth <small>Team ALPHA</small>	PILOT PLANT II - Processing Culture <small>Team OMEGA</small>	IV - CIRCULAR ECONOMY - Algae Production as a CCU / CCS Mechanism <small>André Pinto, A4F</small> - SABANA Project: Demonstrating the Application of Microalgae in Agriculture and Aquaculture <small>Gabriel Aires, University of Almeria</small> - Integrating Microalgae Production with Industrial Outputs <small>Sara Badenes, A4F</small>	PILOT PLANT II - Processing Culture <small>Team ALPHA</small>
13:00 h		LUNCH	LUNCH	LUNCH	LUNCH	
14:00 h		II - MICROALGAE DSP - Harvesting Techniques <small>Luis Costa, A4F</small> - Biorefinery & Extraction <small>Blanca Gomez, CoLab (ICP) A4F</small> - Standardization and Analytical Methodologies <small>Silvio Mangini, Archimede Recherche</small>	LAB IV - Analysis of Cultures <small>Team ALPHA</small>	PILOT PLANT III - Drying of biomass <small>Team OMEGA</small>	V - MULTISTR3AM WORKSHOP - Multi-str3am biorefinery: what are the challenges <small>Cristina Matos, A4F</small> - Alternative process solutions <small>Alberto Real, IMA4F</small> - Membranes technology <small>João Crespo, IBET</small> - Regulatory landscape <small>Teresa Crespo, IBET</small>	PILOT PLANT III - Drying of biomass <small>Team ALPHA</small>
15:30 h		COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	
16:00 h		III - MICROALGAE GROWTH TOOLS - Growth tools: Productivity Assessment <small>Liliana Rodighi, UNIFI</small> - Small Plants, Big Ideas: Delivering the Promise of Chlorella as a Mainstream Ingredient <small>Andrew Spicer, AlgenUnity</small> - Contaminants and Crop Protection <small>Catrina Barreira, A4F</small> - Algapreneur - Tomar Natural - Spirulina Farm <small>Ana Pereira, Tomar Natural</small>	LAB V - Characterization of Biomass - Pigments <small>Team ALPHA</small>	PILOT PLANT IV - Preparation of PBR and Inoculation <small>Team OMEGA</small>	V - MULTISTR3AM WORKSHOP Case studies Group Activities	PILOT PLANT IV - Preparation of PBR and Inoculation <small>Team ALPHA</small>
17:30 h						
Evening	WELCOME DINNER				SOCIAL EVENT	


Partner	Date	Online/Offline	Means of verification, References & Links
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A4F	21 st November 2022	Online	https://www.limbac.com/files/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	15	20						35

3.6 Training

3.6.1 Lecture by Alberto Reis (LNEG) in the Algae Biorefinery workshop in LIMBAC2022 "Alternative (new) process solutions for microalgae biomass processing"






Alternative (new) process solutions for microalgae biomass processing



ALBERTO REIS
LNEG

UBB- BIOENERGY AND BIOREFINERIES UNIT
BBRI- BIOMASS & BIOENERGY RESEARCH INFRASTRUCTURE

Partner	Date	Online/Offline	Means of verification, References & Links
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LNEG	21 st September 2022	Offline	https://www.limbac.com/files/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	15	20						35

3.6.2 International ESEIA student camp: "Process Development and Process Evaluation in Biorefinery Industry" organized in LNEG



Home About us Membership Expertise Education and Training Communication Contact



ESEIA INTERNATIONAL STUDENT CAMP 2022 CHALLENGED STUDENTS TO DEVELOP INNOVATIVE SOLUTIONS FOR BIOREFINERY INDUSTRY

Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG	26 th September 2022	Offline	https://eseia.eu/news/eseia-international-student-camp-2022-students-develop-innovative-solutions/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	20	1						21

3.6.3 Participation of LNEG in the 2022 European Researcher's Night, Lisbon, Portugal



Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG	30 th September 2022	Offline	https://www.lneg.pt/participacao-do-lneg-na-noite-europeia-dos-investigadores-2022/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached		1	30		1			32

3.6.4 Participation of LNEG in the 2021 European Researcher’s Night, Lisbon, Portugal



Partner	Date	Online/Offline	Means of verification, References & Links
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LNEG	24 th September 2021	Offline	https://www.lneg.pt/lneg-participou-na-noite-europeia-dos-investigadores-2021/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached			20					20

3.6.5 Oral and Poster presentation at the training school on aerogels for biomedical applications @ KU Leuven

Presentation of the work “A circular economy approach for the production of novel aerogels with materials derived from algae and fish residues”.



Funded by the Horizon 2020 Framework Programme of the European Union

KU LEUVEN



Training School – Leuven, Belgium
 Tuesday 07th June – Friday 10th June 2022

Aerogels for biomedical applications



Co-funded by the European Union



Flanders
State of the Art



Vlaamse overheid

Partner	Date	Online/Offline	Means of verification, References & Links					
iBET	7-10 th June 2022	Offline	https://www.epnoe.eu/training-school-aerogels-leuven-2022-home/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	50							50

3.6.6 Lecture on Membrane Technology in a Microalgae Biorefinery: protein case-study at LIMBAC 2022, Lisbon, Portugal



LISBON
MICROALGAE
BIOTECHNOLOGY
4th ADVANCED
COURSE 2022

WORKSHOP



Membrane technology in a microalgae biorefinery: protein case-study

Carla Brazinha

LAQV-REQUIMTE, Chemistry Department, FCT, Universidade Nova de Lisboa, 2829-516 Caparica



Partner	Date	Online/ Offline	Means of verification, References & Links					
iBET	21 st September 2022	Offline	https://www.limbac.com/files/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	15	20						35

3.6.7 Lecture on Regulatory Landscape at LIMBAC 2022, Lisbon, Portugal



LISBON
MICROALGAE
BIOTECHNOLOGY
4th ADVANCED
COURSE 2022

WORKSHOP



Regulatory landscape

Partner	Date	Online/ Offline	Means of verification, References & Links					
iBET	21 st September 2022	Offline	https://www.limbac.com/files/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	15	20						35

3.7 Participation to a Conference

3.7.1 LNEG participation in the EUBCE 2022 – “Process Simulation Tool for Modelling a Microalgae-Based Multi-Strain Biorefinery to Obtain Multi-Product Fractions for Food, Feed and Fragrance”

Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG	10 th May 2022	Online	https://programme.eubce.com/2022/abstract.php?idabs=19332&ids_es=1375&idtopic=12					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	200	100						300

3.7.2 A4F participation to the AlgaEurope2022 presenting “MULTI-STR3AM: A sustainable multi-strain, multi-method, multi-product microalgae biorefinery integrating industrial side streams to create high value products” in Rome, Italy



Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	13-15 th December 2022	Offline	https://algaeurope.org/attending-companies/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	425	225						650

3.7.3 A4F presentation of MULTI-STR3AM project @ EUBCE 30th – Industry Session

A sustainable multi-strain, multi-method, multi-product microalgae biorefinery integrating industrial side streams to create high-value products for food, and fragrance



<https://a4f.pt/en>

Laura Monteiro




9 - 12 May 2022 | Online




Partner	Date	Online/Offline	Means of verification, References & Links					
A4F	9-12 th May 2022	Online	https://www.eubce.com/wp-content/uploads/2022/05/Industry-Track-Programme-2022.pdf					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	500	700			30	30		1260

3.7.4 iBET participation to the AlgaEurope2022 presenting "Screening extracellular lytic enzymatic activities on microalgae-recruited bacterial isolates for downstream processing applications in microalgae biorefinery" in Rome, Italy



IBET
Instituto de Biologia Experimental e Tecnológica



ITQB NOVA
Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Av. da República, 2780-157 Oeiras, Portugal

Screening extracellular lytic enzymatic activities on microalgae-recruited bacterial isolates for downstream processing applications in microalgae biorefinery

Bertrand, M. C.^{1,2}, Quintas-Nunes, F.^{1,2}, Reynolds-Brandão, P.¹, Nascimento, F. X.¹

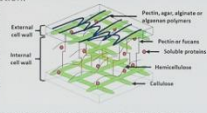

¹IBET, Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2781-901 Oeiras, Portugal
²ITQB NOVA, Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Av. da República, 2780-157 Oeiras, Portugal

INTRODUCTION & AIM

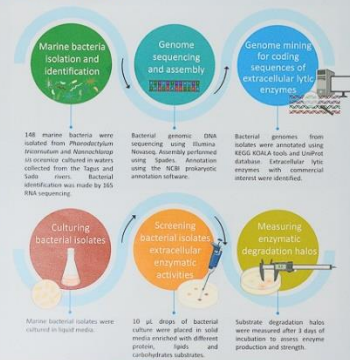
Microalgae downstream processing is an **expensive and challenging stage** in the microalgae industry. This is a consequence of microalgae's **complex cell wall composition and structure** which requires the use of **unsustainable chemicals or energy demanding processes** to achieve cell wall disruption.

In this regard, the use of **bacterial lytic enzymes** is an alternative solution. Enzymes require **mild reaction conditions, target specific microalgae cell wall components** and their application results in **lower energy and water requirements**.

In this work, the microbiome recruited "in vitro" by *Phaeodactylum tricornutum* and *Nannochloropsis oceanica* was screened for enzymatic activities to **discover new marine extracellular lytic enzymes** tailored for the microalgae biorefinery.

METHODS






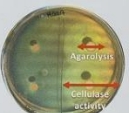
RESULTS

Genome mining analysis performed to the bacterial isolates indicated the **presence of multiple extracellular lytic enzymes**.

For example, a *Pseudoalteromonas* isolate revealed the presence of several **extracellular lytic enzymes** that participate in the catabolism of some cell wall carbohydrates:

Carbohydrate metabolism	Number of lytic enzymes
Starch	8
Chitin	3
Cellulose	1
Others	16
Uncharacterized	2
Total	30



Genus	Proteins		Lipids			Carbohydrates				Average halo diameter (cm)
	Slimed milk	Tributyrin	Repossed oil	Chitin	Alginate	Cellulose	Starch	Pectin	Agar-agar	
<i>Pseudoalteromonas</i>	3.3	3.3	2.3	3.8	3.8	3.8	3.9	3.4	0.4	3.0
<i>Vibrio</i>	3.0	3.1	1.0	3.3	3.4	3.6	3.0	3.3	0.1	2.7
<i>Alteromonas</i>	3.2	2.4	2.0	3.0	2.8	3.3	2.2	3.2	0.2	2.5
<i>Agarivorans</i>	3.0	4.0	1.0	2.0	2.0	2.0	3.0	1.0	3.0	2.3
<i>Marinobacter</i>	3.0	2.0	0.0	3.0	4.0	3.0	4.0	0.0	0.0	2.1
<i>Zobellia</i>	2.5	2.5	2.0	3.0	3.0	2.5	2.5	2.0	0.5	2.3
<i>Fenichelium</i>	3.5	0.5	1.0	3.5	3.0	3.0	2.5	2.5	0.0	2.2
<i>Halobacter</i>	2.3	2.3	1.0	2.8	2.3	2.8	2.3	2.5	0.5	2.1
<i>Lentibacter</i>	2.0	2.0	0.0	3.0	3.0	3.0	2.0	3.0	0.0	2.0




The diameters (cm) of the substrate degradation halos measured indicate the extracellular lytic enzyme activities of the bacterial isolates, towards several substrate classes: proteins, lipids and carbohydrates. The genera with higher extracellular lytic enzyme activities are represented on the table above. *Pseudoalteromonas* genus displayed the highest overall lytic enzyme power. The highest enzyme producer genus for each substrate is highlighted.

CONCLUSIONS

The bacterial isolates obtained from *Phaeodactylum tricornutum* and *Nannochloropsis oceanica* microbiome recruitment cultures presented **powerful extracellular lytic enzyme activities towards protein, lipid, and carbohydrate substrates**, that are present in microalgae cell walls. The enzymes from the isolates with highest activities were identified through genome mining and will be studied regarding their **kinetic and stability properties** for later application in microalgae biorefinery. The research will focus on **enzymes resistant under marine conditions**.

ACKNOWLEDGMENTS

This work was supported by the PRED-3-BIOME project (PTDC/BAA-BIO/1262/2020) funded by Fundação para a Ciência e a Tecnologia, Portugal (FCT) and the MULTI-STREAM project funded by the Bio-Based Industries Joint Undertaking (JU) under grant agreement No. 51188222 – MULTI-STREAM. The JU receives support from the European Union's Horizon 2020 research and innovation 512 programme and the Bio-Based Industries Consortium.

Food and Health Division, IBET & ITQB-NOVA, Portugal
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ALGAEUROPE 2022

Partner	Date	Online/ Offline	Means of verification, References & Links					
IBET	13-15 th December 2022	Offline	https://algaeeurope.org/poster-presentations/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	425	225						650

3.7.5 iBET participation to the AlgaEurope2022 presenting "Monitoring productivity and status of *Phaeodactylum tricornutum* cultures using Machine Learning and Spectroscopy" in Rome, Italy

Partner	Date	Online/ Offline	Means of verification, References & Links						
iBET	13-15 th December 2022	Offline	https://algaurope.org/poster-presentations/						
Persons reached	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total	
	425	225						650	

3.7.6 iBET participation to the MicroSummit held in Porto – Oral presentation “Monitoring productivity and status of *Phaeodactylum tricornutum* cultures using spectroscopy and machine learning” in Porto, Portugal



Partner	Date	Online/Offline	Means of verification, References & Links					
iBET	25 th November 2022	Offline	https://microsummit-2022.com/program/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	31							31

3.7.7 iBET participation in bilateral meetings regarding the use of membranes in microalgae downstream processing @ the Euromembrane 2022 in Sorrento, Italy

Direct contact with different producers of hollow fiber membranes for microalgae downstream processing.



Partner	Date	Online/Offline	Means of verification, References & Links
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iBET	20-24 th November 2022	Offline	https://www.euromembrane2022.eu/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	Unknown
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3.7.8 Phycom participation in the Eiwit transitie congres (protein transition conference) @ Kamerik, The Netherlands



Partner	Date	Online/Offline	Means of verification, References & Links
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Phycom	16 th March 2023	Offline	https://www.foodagribusiness.nl/eiwittransitie-congres/#/p-pom-block-1521
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	10	110			10			130
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3.7.9 Phycom participation in the Proveg veggie challenge 2024 kick-off meeting



Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	31 th March 2023	Offline	https://veggiechallenge.nl/veggiechallengelive/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached		50	50	50		50		200

3.7.10 Oral presentation “Separation of eicosapentaenoic acid from the diatom *Nanofrustulum shiloi* via two-step high performance countercurrent chromatography” by IMIC @ AlgaEurope 2022 conference Rome, Italy



Conference ▾ Organizers Committee Sponsorship ▾ Previous Conferences ▾ Photo Gallery Media ▾ Contact ✉

02:15 pm - 03:30 pm: Session 6: Biorefinery

02:15 pm - 02:30 pm: Cheel, José (Institute of Microbiology of the Czech Academy of Sciences, Centre Algatech): *Separation of eicosapentaenoic acid from the diatom Nanofrustulum shiloi via two-step high performance countercurrent chromatography*

02:30 pm - 02:45 pm: Costa, Luis (A4F - Algae for Future): *From wastewater to biojetfuel: a circular economy system using microalgae for wastewater bioremediation and raw material for biojetfuel through hydrothermal liquefaction*

02:45 pm - 03:00 pm: Marchal, Luc (Nantes University): *Eco-design of a downstream process for enriched fucoxanthin production from *Tisochrysis lutea**

03:00 pm - 03:15 pm: Madugu, Fatima (University of Manchester): *Enhanced cultivation strategy for industrial scale algae-based biorefineries*

03:15 pm - 03:30 pm: Kazbar, Antoinette (Wageningen University & Research): *Multi-product biorefinery of Seaweed using green solvents*

Partner	Date	Online/Offline	Means of verification, References & Links
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IMIC	14 th December 2022	Online	https://algaeurope.org/conference-program-2022/
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	400							400

3.7.11 IMIC’s participation in EFFoST Conference - Phenotypic Enhancement of *Chlorella vulgaris* for Food Applications (poster presentation)



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36th EFFoST International Conference 2022

Shaping the Production of Sustainable, Healthy Foods for the Future

7-9 November 2022 | Dublin, Ireland

[EFFoST Conference 2023](#)

[Past EFFoST Conferences](#)

[EFFoST Conference 2022](#)

[Conference Committee](#)

Partner	Date	Online/Offline	Means of verification, References & Links
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IMIC	7-9 th November 2022	Offline	36th EFFoST International Conference 2022 EFFoST
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	300							300
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3.8 Press release

3.8.1 Press release announcing the first year of operations of the MULTI-STR3AM biorefinery



Press Release

First year of operations of the MULTI-STR3AM biorefinery

Lisbon, April 26th, 2023

The MULTI-STR3AM project, which aims to develop a sustainable biorefinery for microalgae-based food, feed and fragrance products, has completed the first year of operations at its biorefinery in Portugal. A4F - Algae for Future, the coordinator of this ambitious project, is implementing a multi-method biorefinery that integrates different species of microalgae and industrial side streams to produce valuable ingredients. This sustainable approach to food and feed production using microalgae will help the EU industry to overcome the challenges of scalability and pricing.

Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	26 th April 2023	Online	https://www.multi-str3am.com/en/press-news					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown							

3.8.2 Press release announcing the approval of new types of microalgae for human consumption thanks to Czech scientists, by IMIC

PEOPLE IN THE EUROPEAN UNION CAN CONSUME NEW TYPES OF MICROALGAE THANKS TO CZECH SCIENTISTS

Press Release

📅 08-11-2022

The Czech Ministry of Agriculture, after several months of proceedings with all EU member states, has decided that additional selected species of the microalgae *Chlorella* can be consumed without lengthy registration. This decision is valid for the entire territory of the European Union. The Ministry based its decision on the results of many years of research done by the Institute of Microbiology of the Czech Academy of Sciences – Algatech Centre in Třeboň, Czech Republic.

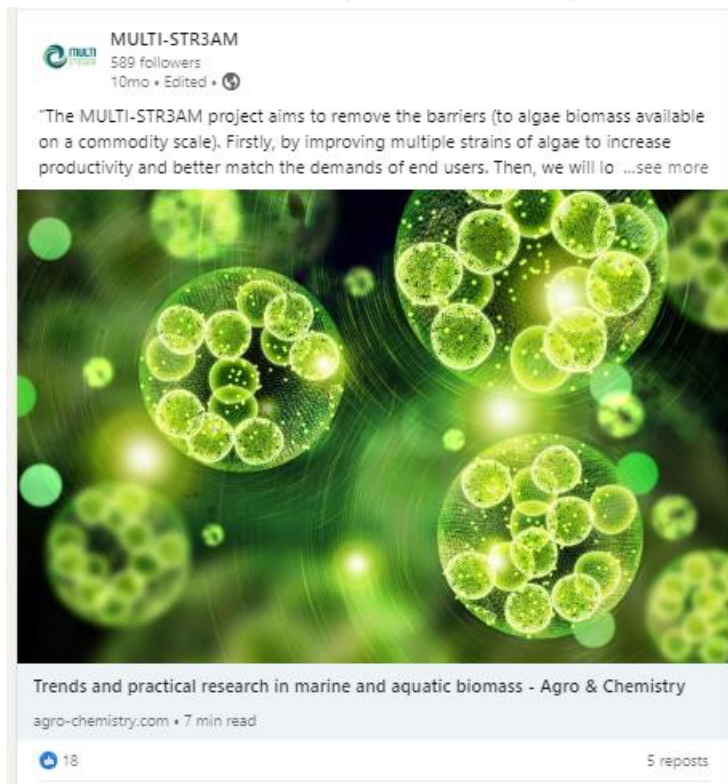
All new foods and food raw materials are subject to relatively strict regulations in the European Union and have to go through a long approval procedure. This applies, for example, to insect proteins, plant extracts or microscopic algae that appear in food supplements or, for example, in the form of oils.



Partner	Date	Online/Offline	Means of verification, References & Links					
IMIC	8 th November 2022	Online	https://www.multi-str3am.com/en/1667921152					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown							

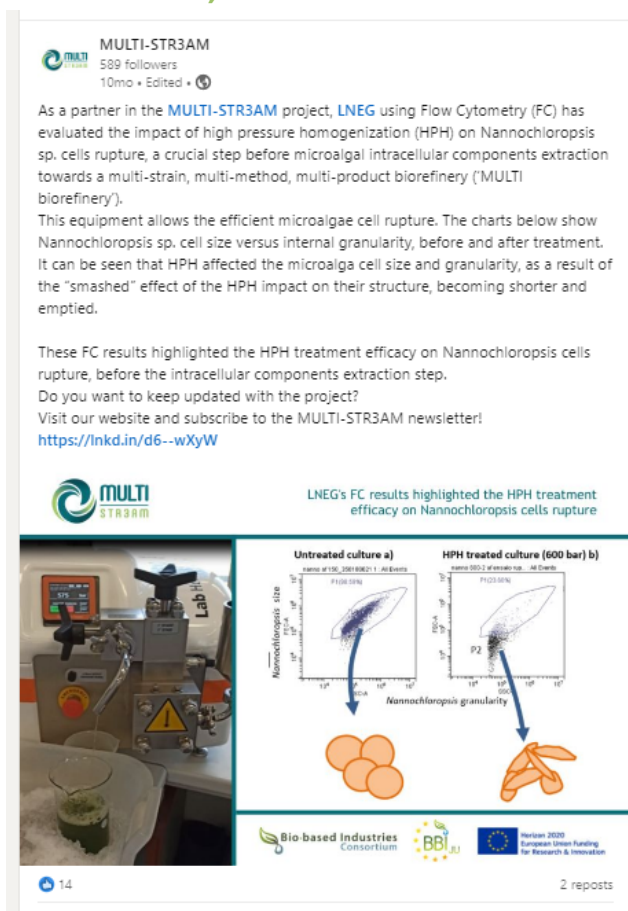
3.9 Social Media

3.8.1 Announcement of the article “Trends and practical research in marine and aquatic biomass” of Agro & Chemistry, focusing on MULTI-STR3AM biomass @ MULTI-STR3AM LinkedIn account (589 followers)



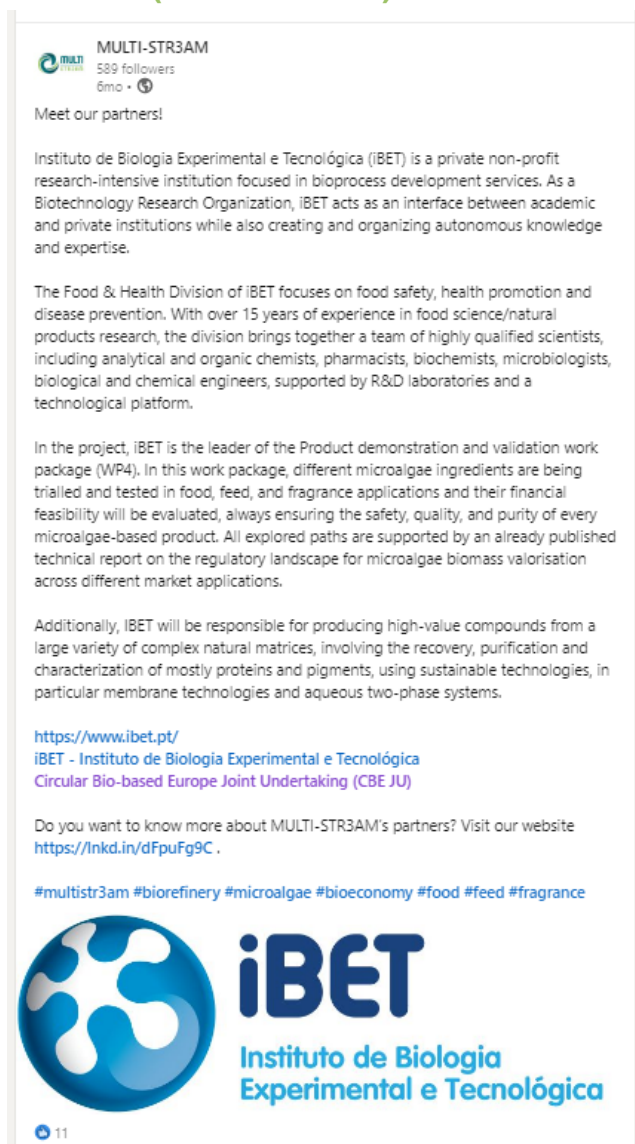
Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	2 nd June 2022	Online	https://www.linkedin.com/feed/update/urn:li:activity:6938176080272879616					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	360	100	50	10	10	20	20	570

3.8.2 MULTI-STR3AM project results shared by LNEG @ MULTI-STR3AM LinkedIn account (589 followers)



Partner	Date	Online/Offline	Means of verification, References & Links					
LNEG	7 th June 2022	Online	https://www.linkedin.com/feed/update/urn:li:activity:6939848332554997761					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	415	185	20	10	12	20	10	672

3.8.3 Announcement of iBET as partner of the MULTI-STR3AM @ MULTI-STR3AM LinkedIn account (589 followers)



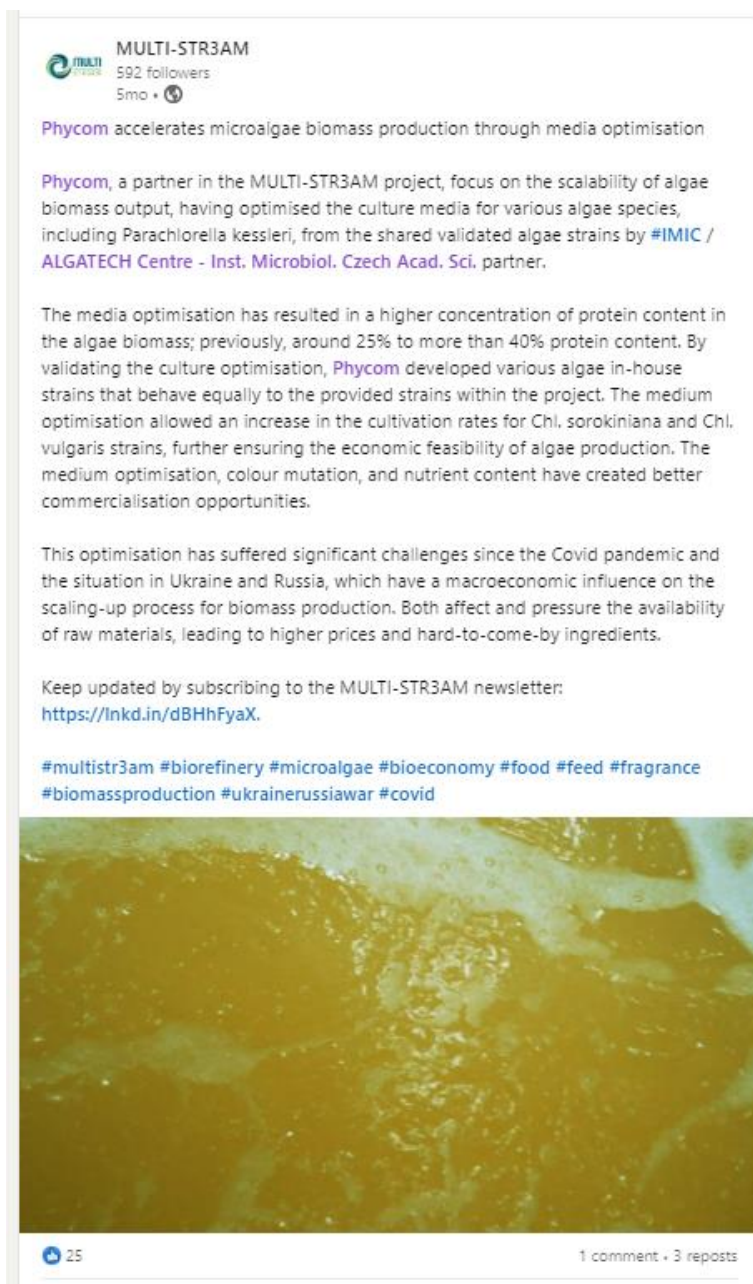
Partner	Date	Online/Offline	Means of verification, References & Links					
iBET	20 th September 2022	Online	https://www.linkedin.com/feed/update/urn:li:activity:6977903567961501696					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	250	127	50	10	10	30	50	527

3.8.4 Announcement of the MULTI-STR3AM project presentation in HLUW in Austria @ ALGATECH LinkedIn account (433 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	28 th September 2022	Online	https://www.linkedin.com/posts/algatech-biotechnology_algatechabrcentre-hluw-algatchabrcentre-activity-6980512991481839617-9foF?utm_source=share&utm_medium=member_desktop					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	80	70	50	2	10	40	20	272

3.8.5 MULTI-STR3AM project results shared by Phycom @ MULTI-STR3AM LinkedIn account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
Phycom	20 th October 2022	Online	https://www.linkedin.com/feed/update/urn:li:activity:6988775277619240960					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	300	450	150	10	30	60	5	1005

3.8.6 Announcement of LNEG as partner of the MULTI-STR3AM project @ MULTI-STR3AM LinkedIn account (592 followers)

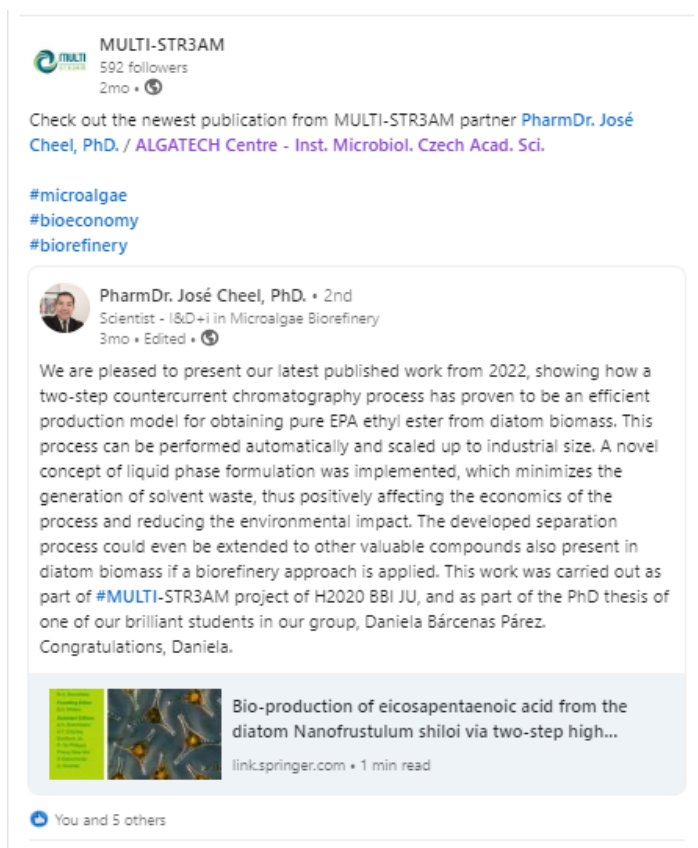


Partner	Date	Online/Offline	Means of verification, References & Links
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LNEG	2 nd November 2022	Online	https://www.linkedin.com/feed/update/urn:li:activity:6993624240956559362
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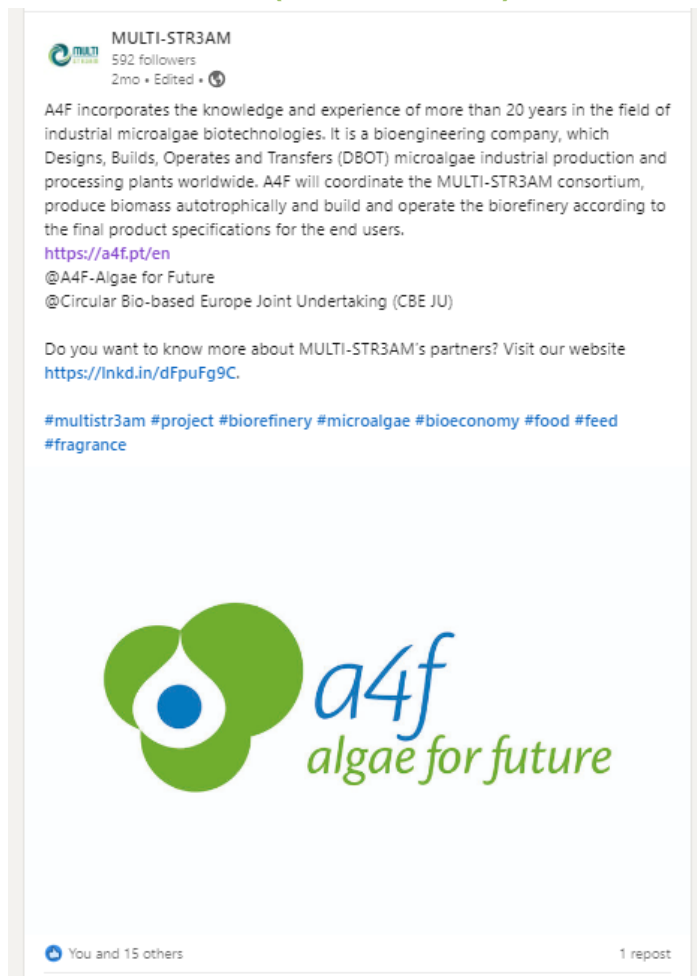
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	190	180	50	10	10	20	20	480

3.8.7 Announcement of IMIC’s scientific publication under the scope of MULTI-STR3AM @ MULTI-STR3AM LinkedIn account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	3 rd January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7016089011387555840					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	225	105	39	20	10	10	10	419

3.8.8 Announcement of A4F as coordinator of the MULTI-STR3AM @ MULTI-STR3AM LinkedIn account (592 followers)

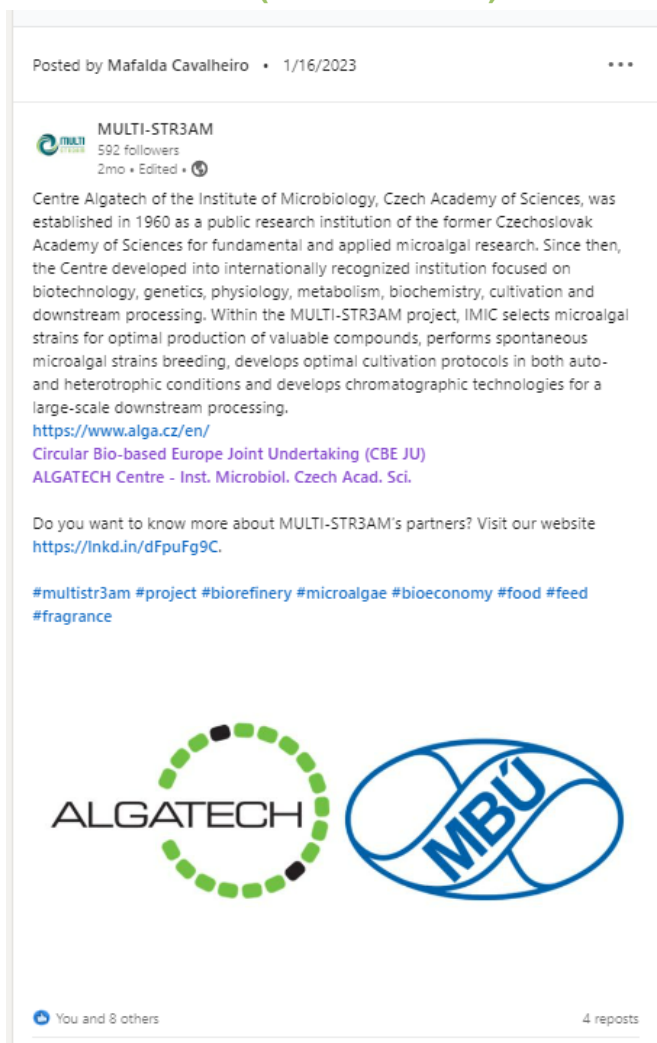


Partner	Date	Online/ Offline	Means of verification, References & Links
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A4F	16 th January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7020763080548593665
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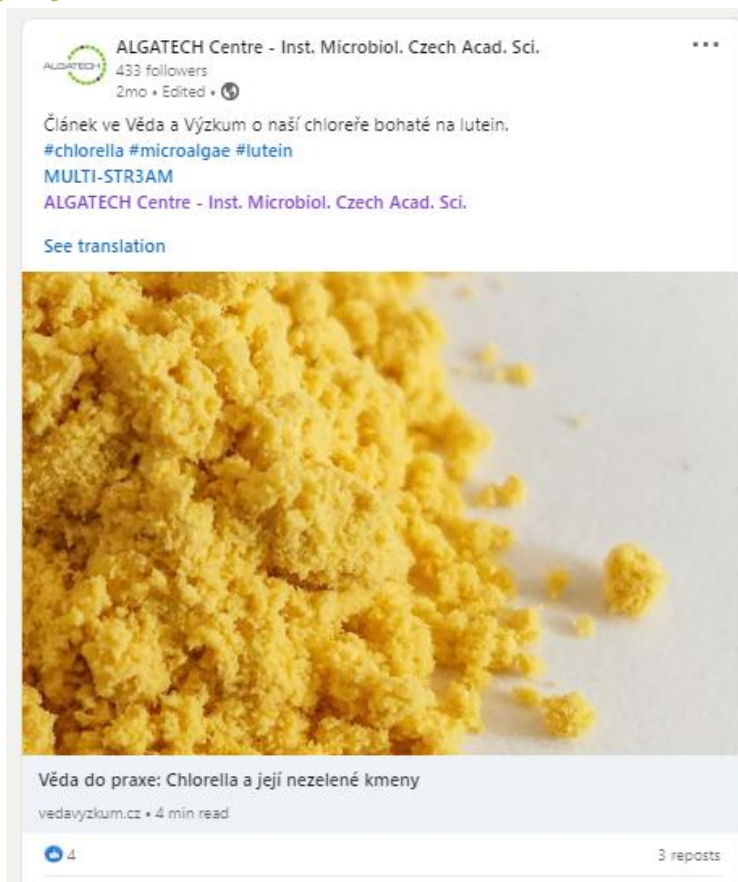
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	185	240	31	20	10	5	5	496

3.8.9 Announcement of IMIC as partner of the MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (592 followers)



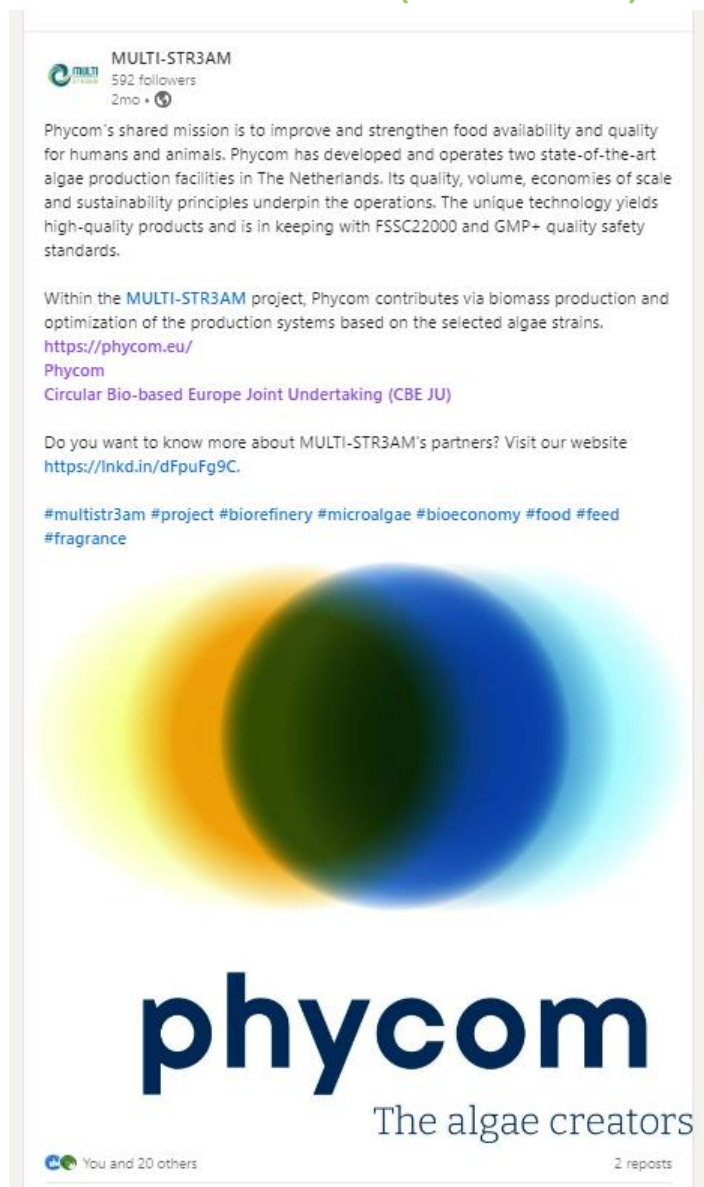
Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	16 th January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7020792693442158594					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	145	125	37	12	20	10	18	367

3.8.10 Announcement of the article in Věda Vyzkum that mentions MULTI-STR3AM project @ ALGATECH Centre LinkedIn Account (433 followers)



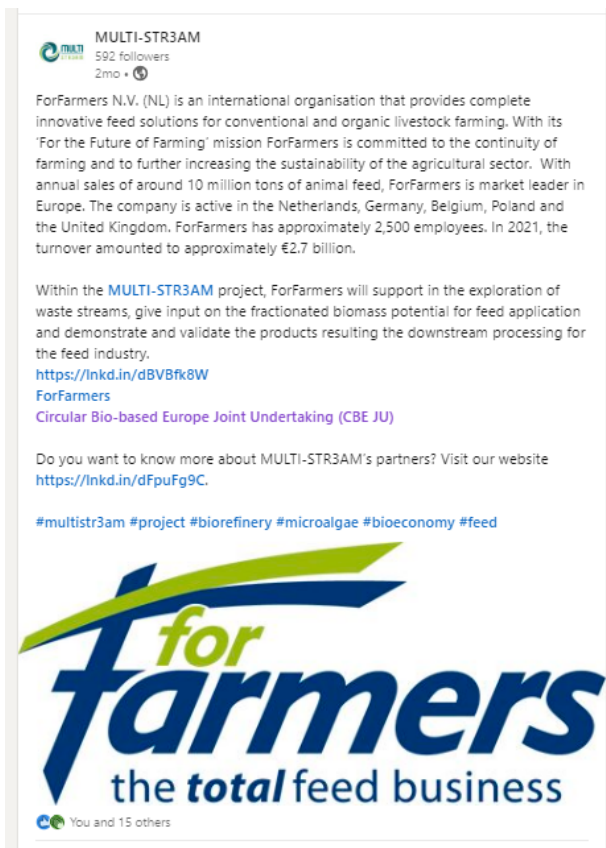
Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	17 th January 2023	Online	https://www.linkedin.com/posts/algatech-biotechnology_v%C4%9Bda-do-praxe-chlorella-a-jej%C3%AD-nezelen%C3%A9-activity-7020678603688288256-lnk4?utm_source=share&utm_medium=member_desktop					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	195	65	80	1				341

3.8.11 Announcement of Phycom as partner of the MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
Phycom	19 th January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7021800273291456512					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	245	205	140	20	24	50	60	744

3.8.12 Announcement of ForFarmers as partner of MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links
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FF	19 th January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7021869705418149889
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	230	200	160	10	5	20	30	655
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3.8.13 Announcement of A4F participation in AlgaEurope2022 presenting MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	23 rd January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7023305201491083264					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	250	290	170	13	20	20	30	793

3.8.14 MULTI-STR3AM project results shared by A4F @ MULTI-STR3AM LinkedIn Account (592 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	27 th January 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7024707908042993664					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	380	420	275	75	50	240	101	1541

3.8.15 MULTI-STR3AM project results shared by Phycom @ MULTI-STR3AM LinkedIn Account (592 followers)

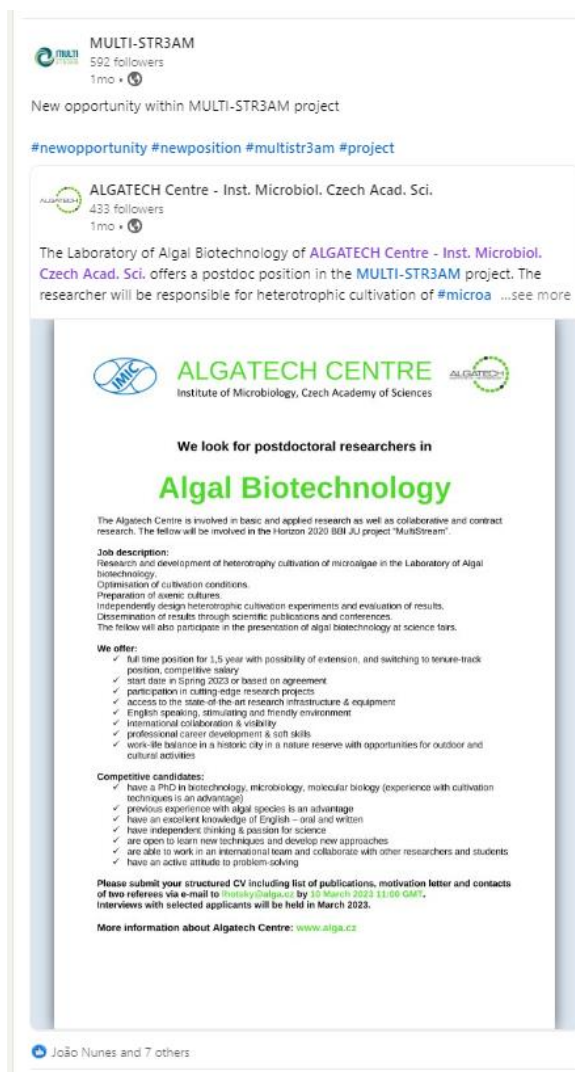


Partner	Date	Online/Offline	Means of verification, References & Links
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Phycom	2 nd February 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7026841004288688128
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	270	205	110	4	20	30	30	669

3.8.16 Announcement of new opportunity within the scope of MULTI-STR3AM at ALGATECH Centre @ MULTI-STR3AM LinkedIn Account (592 followers)

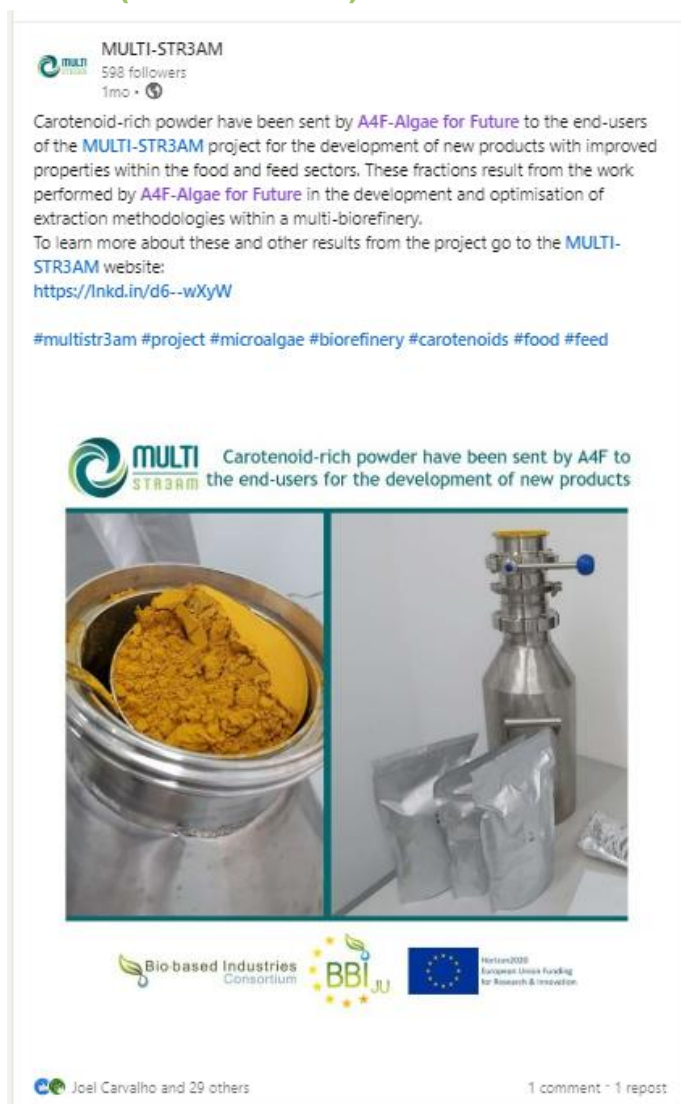


Partner	Date	Online/Offline	Means of verification, References & Links
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IMIC	6 th February 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7028364671766126593
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	100	60	70	20	30	20	35	335

3.8.17 MULTI-STR3AM project results shared by A4F @ MULTI-STR3AM LinkedIn Account (598 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	7 th February 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7028686657444884480					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	240	350	170	30	40	8	40	878

3.8.18 Announcement of the Social Life Cycle Impact Assessment task within MULTI-STR3AM under the responsibility of LNEG @ MULTI-STR3AM LinkedIn Account (598 followers)



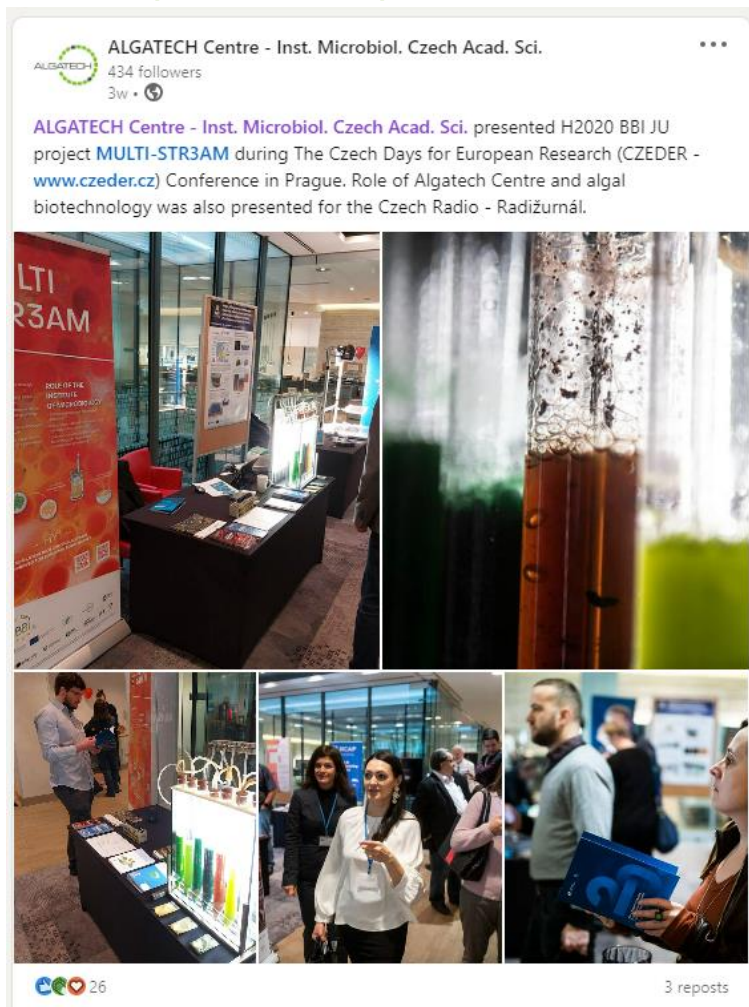
Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG	14 th February 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7031317204600037377					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	170	166	100	5	2	3	10	456

3.8.19 Announcement of the work under development by IMIC in the MULTI-STR3AM project @ ALGATECH Centre LinkedIn Account (434 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	23 rd February 2023	Online	https://www.linkedin.com/posts/algatech-biotechnology_chlorella-microalgae-epa-activity-7034447256153903104-sfqf?utm_source=share&utm_medium=member_desktop					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	95	75	80	25	35	10	23	343

3.8.20 Announcement of IMIC presentation of MULTI-STR3AM project at The Czech Days for European Research (CZEDER) @ ALGATECH Centre LinkedIn Account (434 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	28 th February 2023	Online	https://www.linkedin.com/posts/algatech-biotechnology_algatech-centre-inst-microbiol-czech-activity-7035899806577217536-le_C/?utm_source=share&utm_medium=member_desktop					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	110	40	70	1	2	1	3	227

3.8.21 Explanation of the work behind Social Life Cycle Impact Assessment by LNEG @ MULTI-STR3AM LinkedIn Account (599 followers)



Partner	Date	Online/Offline	Means of verification, References & Links					
LNEG	3 rd March 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7037442885448798208					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	85	75	63	3	2	5	20	253

3.8.22 Announcement of iBET’s participation in the work developed by CEN/TC 454 of CEN @ MULTI-STR3AM LinkedIn Account (599 followers)



Partner	Date	Online/Offline	Means of verification, References & Links
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iBET	13 th March 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7041085165225324544
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	45	75	40	60	4	10	10	244

3.8.23 Announcement of new publication under the scope of MULTI-STR3AM by LNEG and A4F @ MULTI-STR3AM LinkedIn Account (599 followers)

MULTI-STR3AM

599 followers

1w • Edited •

Take a look at the most recent publication within the scope of **MULTI-STR3AM** project: "Conceptual Design of an Autotrophic Multi-Strain Microalgae-Based Biorefinery: Preliminary Techno-Economic and Life Cycle Assessments", a research paper published in Fermentation by **LNEG** and **A4F-Algae for Future** partners.

This paper describes a developed conceptual design of a microalgae production plant, including harvesting, dewatering, cell disruption, and aqueous fraction processes, through process simulation. The model created allows assessment of economics, process integration, optimization, and equipment design of a whole multi-biorefinery demo plant, as well as the development of techno-economic and life-cycle for different production pathways.

To read the complete paper download the pdf version in the project's website:
https://lnkd.in/d_A-5GvD

#multistr3am #project #scientificpaper #microalgae #biorefinery
 #lifecleassessment #technoeconomicanalysis

João Nunes and 22 others

1 repost

Partner	Date	Online/ Offline	Means of verification, References & Links					
LNEG and A4F	14 th March 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7041423372672483328					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	180	90	110	30	30	70	56	566

3.8.24 Update on the work developed within CEN/TC 454 with the participation of iBET partner of MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (601 followers)



Partner	Date	Online/Offline	Means of verification, References & Links
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iBET	21 st March 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7043907350029557760
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	21	20	30	50	4	3	3	131

3.8.25 Update on the work developed within CEN/TC 454 with the participation of iBET partner of MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (692 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
iBET	27 th March 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7046044177079373826					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	50	25	25	193	50	20	30	393

3.8.26 IBET members contributing to the development of a monitoring tool @ Publication on iBET’s Twitter Account (960 followers)



Partner	Date	Online/Offline	Means of verification, References & Links					
iBET	4 th April 2023	Online	https://twitter.com/ibetportugal/status/1643263104476741632					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	20	16		42				78

3.8.27 IBET members contributing to the development of a monitoring tool @ MULTI-STR3AM LinkedIn Account (692 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
iBET	4 th April 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7048649972770123776					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	200	130	145	104	100	50	50	779

3.8.28 Announcement of the reception of Phycom’s biomass and following tests at A4F and LNEG for further processing @ MULTI-STR3AM LinkedIn Account (692 followers)



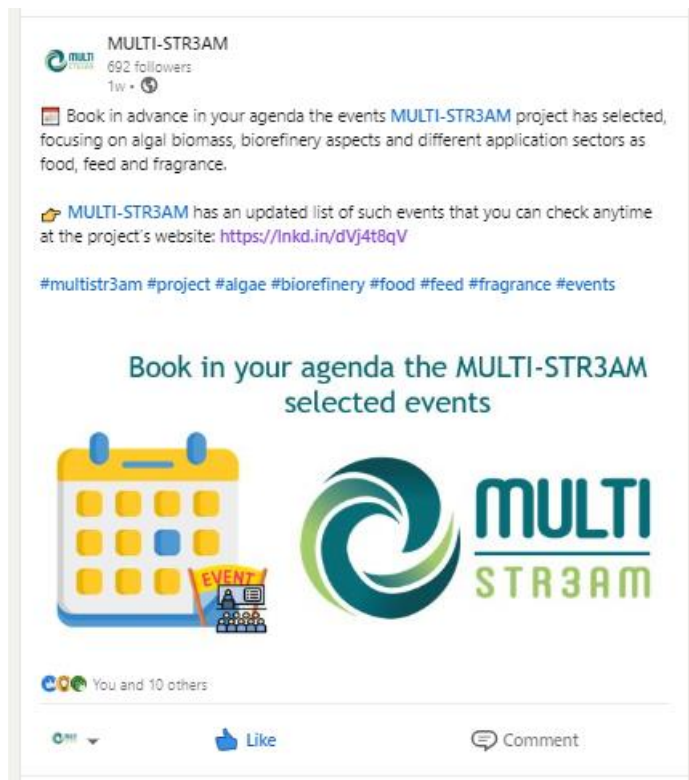
Partner	Date	Online/Offline	Means of verification, References & Links
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A4F	10 th April 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7051123503462322176
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
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Persons reached	440	540	106	50	150	110	90	1486
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3.8.29 Announcement of the list of events selected by the MULTI-STR3AM consortium @ MULTI-STR3AM LinkedIn Account (692 followers)



Partner	Date	Online/Offline	Means of verification, References & Links
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A4F	17 th April 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7053719810345476096
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	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	87	90	40	10	40	60	20	347

3.8.30 Update on the work developed within CEN/TC 454 with the participation of iBET partner of MULTI-STR3AM @ MULTI-STR3AM LinkedIn Account (692 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
iBET	20 th April 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7054733541095448576					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	160	120	41	60	20			401

3.8.31 Announcement of the processed biomass by A4F, shipped to ForFarmers for further analysis of its potential in feed applications @MULTI-STR3AM LinkedIn Account (692 followers)



Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	26 th April 2023	Online	https://www.linkedin.com/feed/update/urn:li:activity:7056977614699175936					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	130	101						231

3.9 Website

3.9.1 MULTI-STR3AM website with updated results



Project handbook

► **PUBLIC DELIVERABLES** 📅 06-07-2021 📎 Download Attachment

This deliverable presents the key aspects of the Multi-Str3am project relative to its organization, procedures and governance. It is divided in 5 main parts and annexes at the end. It intends to be a simple and practical guide to support project partners in the successful execution of the project tasks.

Quality and Risk Management Plan

► **PUBLIC DELIVERABLES** 📅 06-07-2021 📎 Download Attachment

This document will serve as a guide to quality assessment between the partners as well as involvement of the Advisory Board. It includes a “risk register” template, which will be continuously updated by the PMO and Steering Committee (SC), as well as a presentation of the control mechanisms at the consortium level to guarantee quality of work delivery and sound risk management. Given the new reality of the pandemic, a “COVID-19 internal operational impact” template was also created to follow-up how the measures of distancing needed to prevent the spread of the virus may impact laboratory and industrial facilities activities, causing delay on tasks and deliveries. The aim of this log template is to document day a day all partners situation and foresee any action that might mitigate possible negative impacts.

Partner	Date	Online/ Offline	Means of verification, References & Links					
A4F	6 th July 2021, 24 th March 2022	Online	https://www.multi-str3am.com/en/results					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached		159						159

3.9.2 MULTI-STR3AM mentioned in ForFarmers Group Website

Algae as novel protein

With an increasing world population and a consequent growing demand for food, new sources of food and feed materials are urgently required. Microalgae is one of the novel proteins that has potential to help bridge that gap without concurrent pressure on land use and without increasing the use of petrochemical-based resources. Its protein content is particularly high.

However, microalgae as a resource remains underdeveloped and underexploited. This means research projects are a necessity in order to help provide a realistic, reliable alternative to existing sources.

ForFarmers is partner in the MULTI-STR3AM project which is designed to overcome the barriers mentioned above. Ultimately, the MULTI-STR3AM project aims to create a roadmap for establishing economically viable microalgae production and exploration, preserving resources and contributing to the EU's circular economy goals.



Partner	Date	Online/Offline	Means of verification, References & Links					
FF	ongoing	Online	https://www.forfarmersgroup.eu/en/sustainability/our-going-circular-strategy/feed-resources/alternative-protein.aspx					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown							

3.9.3 MULTI-STR3AM mentioned in Phycom’s website



MENU 




Phycom partners in MULTI-STR3AM

DECEMBER 2020 - Phycom is honoured with the approval of the MULTI-STR3AM project. The Bio-Based Industries Joint Undertaking (BBI-JU) catalyzes a sustainable bio-based economy in Europe. The BBI-JU project aims for a sustainable multi-strain, multi-method, multi-product microalgae biorefinery integrating industrial side streams to create high-value food, feed and fragrance products. As a biomass producer, Phycom benefits significantly from participating in MULTI-STR3AM and the emergence of the MULTibiorefinery process. It enables the increased

Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	2022	Online	https://phycom.eu/phycom-partners-in-multi-str3am/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	44	44	44	44	44	44	44	311

3.10 Trade Fair

3.10.1 Phycom participated in the FreeFrom Event @ RAI, Amsterdam



Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	22-23 rd November 2022	Offline	https://amsterdam.freefromfoodexpo.com/					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	25	150	10	10	10	10		215

3.11 Video

3.11.1 Phycom’s video development “Algae in meat alternatives” @ YouTube



Partner	Date	Online/ Offline	Means of verification, References & Links					
Phycom	17 th March 2023	Online	Joris Schildknecht: Algae in meat alternatives - YouTube					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached			15					15

3.11.2 Phycom’s video development “Algae as creative culinary ingredient” @ YouTube



Partner	Date	Online/Offline	Means of verification, References & Links					
Phycom	30 th August 2022	Online	Bas Cloo: Algae as creative culinary ingredient. - YouTube					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached			19					19

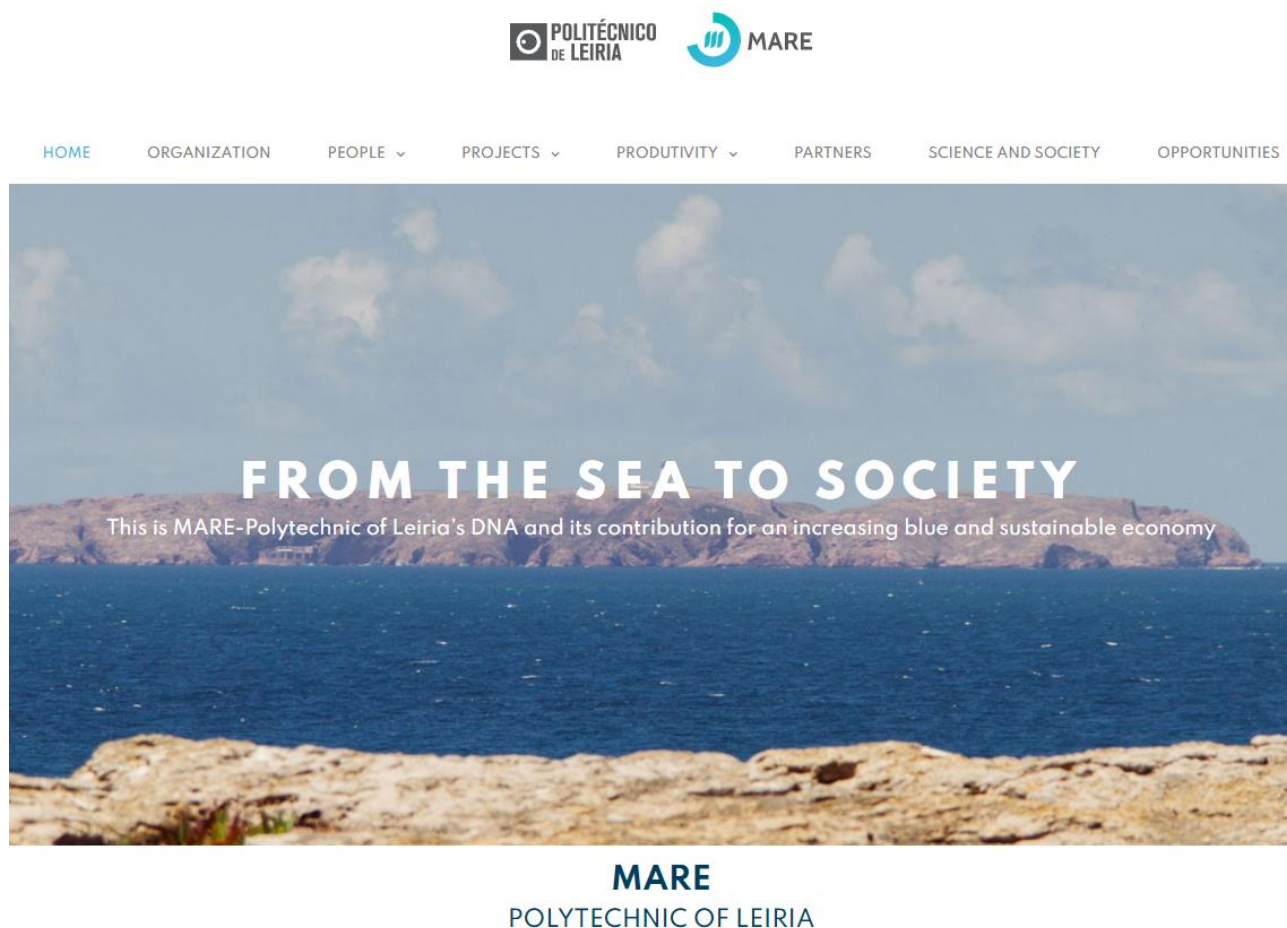
3.11.3 IMIC's video about the research of heterotrophic strains within MULTI-STR3AM project @ YouTube



Partner	Date	Online/Offline	Means of verification, References & Links					
IMIC	10 th December 2021	Online	https://www.youtube.com/watch?v=gG9VWGWPadc					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached			112					112

3.12 Other

3.12.1 LNEG’s technical-scientific visit to MARE-IPLeiria to present the projects using aquatic biomass and discuss possible collaborations



Partner	Date	Online/Offline	Means of verification, References & Links					
LNEG	8 th March 2023	Offline	https://mare.ipleiria.pt					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	2							2

3.10.3 IMIC participation in Science Fair

Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	2-4 th June 2022	Offline	-					
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached	Unknown			2000				2000

3.10.4 IMIC participation in Science Night

Partner	Date	Online/ Offline	Means of verification, References & Links					
IMIC	30 th September 2022	Offline						
	Scientific Community	Industry	General Public	Policy Makers	Media	Investors	Customers	Total
Persons reached				150				150

4. Future phases

By M37, the MULTI-STR3AM project will be in full development of the dissemination development phase, working intensively to disseminate the project's results in conferences, articles, press releases, website and other social media avenues. Due to the delay of the project, due to the covid-19 pandemic, this phase of dissemination will last until month 48. From M48 until the end of the project (M60), the consortium will focus the dissemination activities in the exploitation and sustainability phase focused on guaranteeing the sustainability of the project's results beyond the project duration, disseminating the final results and set the ground for exploitation of results after the project end.

Meanwhile, communication activities are continuously being implemented by all partners within the consortium, with a great emphasis on social media, websites, and presentation of the project in different events and activities. The LinkedIn Page of the MULTI-STR3AM project has allowed a higher interaction with the community (now with 692 followers), improving the awareness towards the project, being an important channel to periodically give information about the project progress to all the interested stakeholders.

The MULTI-STR3AM consortium intends to increase its communication activities and start organizing its own events to prepare the path for future innovative results acknowledgment and exploitation.



This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union’s Horizon 2020 research and innovation programme under grant agreement No 887227. The JU receives support from the European Union’s Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.