

FERMENTED BEAUTY, THE FUTURE OF SUSTAINABLE COSMETICS



Fanny Coste, Cosmebiome Ltd

May 4, 2022

NEW YORK
Society of Cosmetic
CHEMISTS

FERMENTED BEAUTY

One of the 6 top 2022 trends according to WGSN

Recent articles in Vogue, Marie Claire, Allure Byrdie, Pop Sugar, Refinery 29, ...

78% of consumers believe that the use of probiotics is beneficial for skin health.

#probioticskincare
viewed two million times
on TikTok in 2021

FERMENTATION

a metabolic process that produces chemical changes in organic substrates through the action of enzymes.

In biochemistry, it is narrowly defined as the extraction of energy from carbohydrates in the absence of oxygen.



10,000
BC

FIRST USE OF FERMENTATION

First biotechnology developed by mankind to produce... beer

1857

ROLE OF MICROORGANISMS

Louis Pasteur showed how specific types of microorganisms cause specific types of fermentations and specific end-products.

1877

POPULARISATION

Louis Pasteur published "Etudes sur la Bière", which was translated into English in 1879 as "Studies on Fermentation".

FERMENTATION

ALREADY A MAJOR SOURCE OF COSMETIC INGREDIENTS

HYDROXY ACIDS

citric acid, lactic acid,
succinic acid

POLYSACCHARIDES

β -glucan, trehalose,
pullulan, various EPS

THICKENERS

xanthan gum, sclerotium
gum, diutan gum

POLYOLS

propanediol, butylene
glycol, glycerine, xylitol

BIOSURFACTANTS

surfactin, sophorolipids,
rhamnolipids, MEL

AMINO ACIDS & PEPTIDES

OILS

squalane, hemisqualane,
triolein

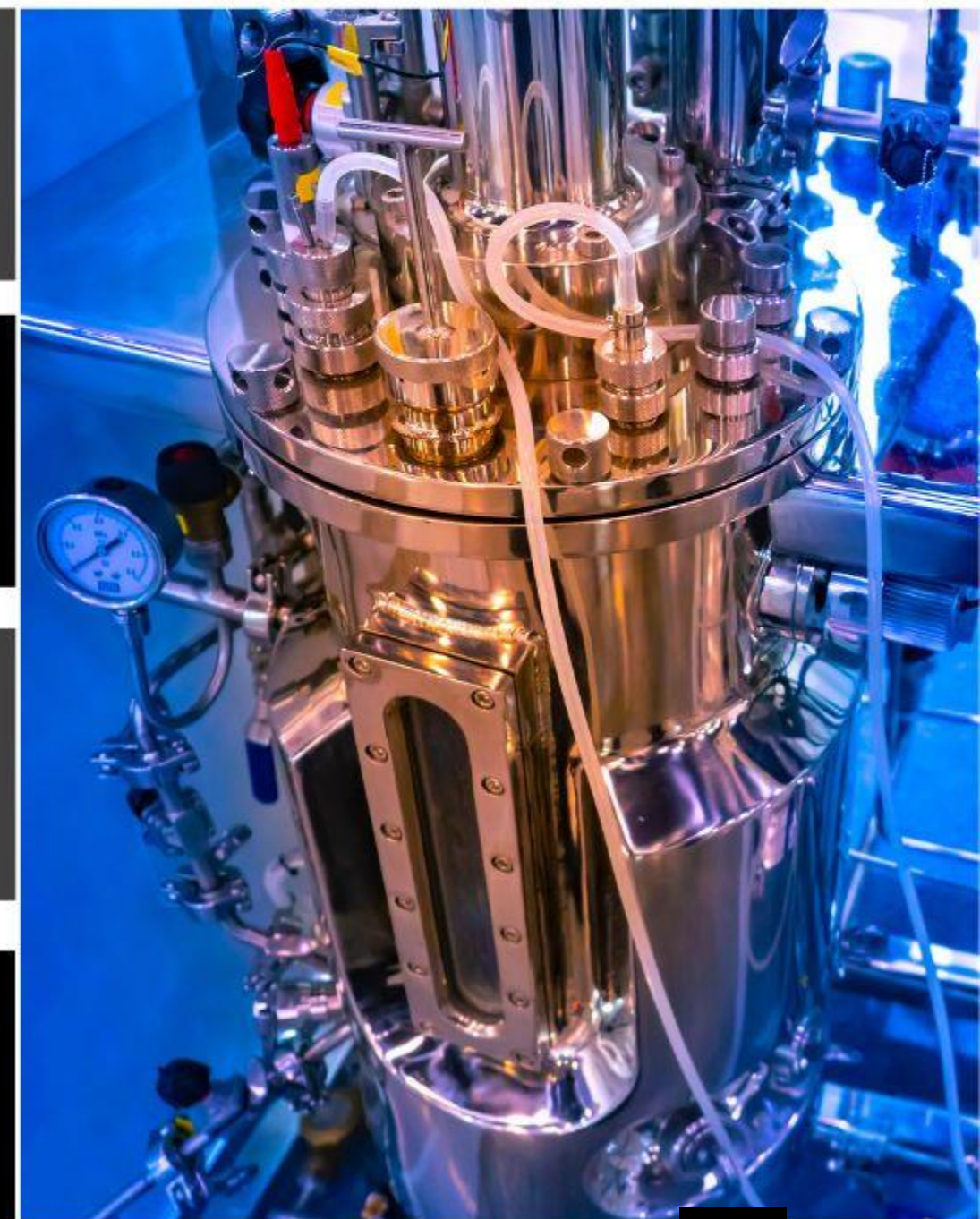
PRESERVATIVES

polylysine, natamycin

FRAGRANCE INGREDIENTS

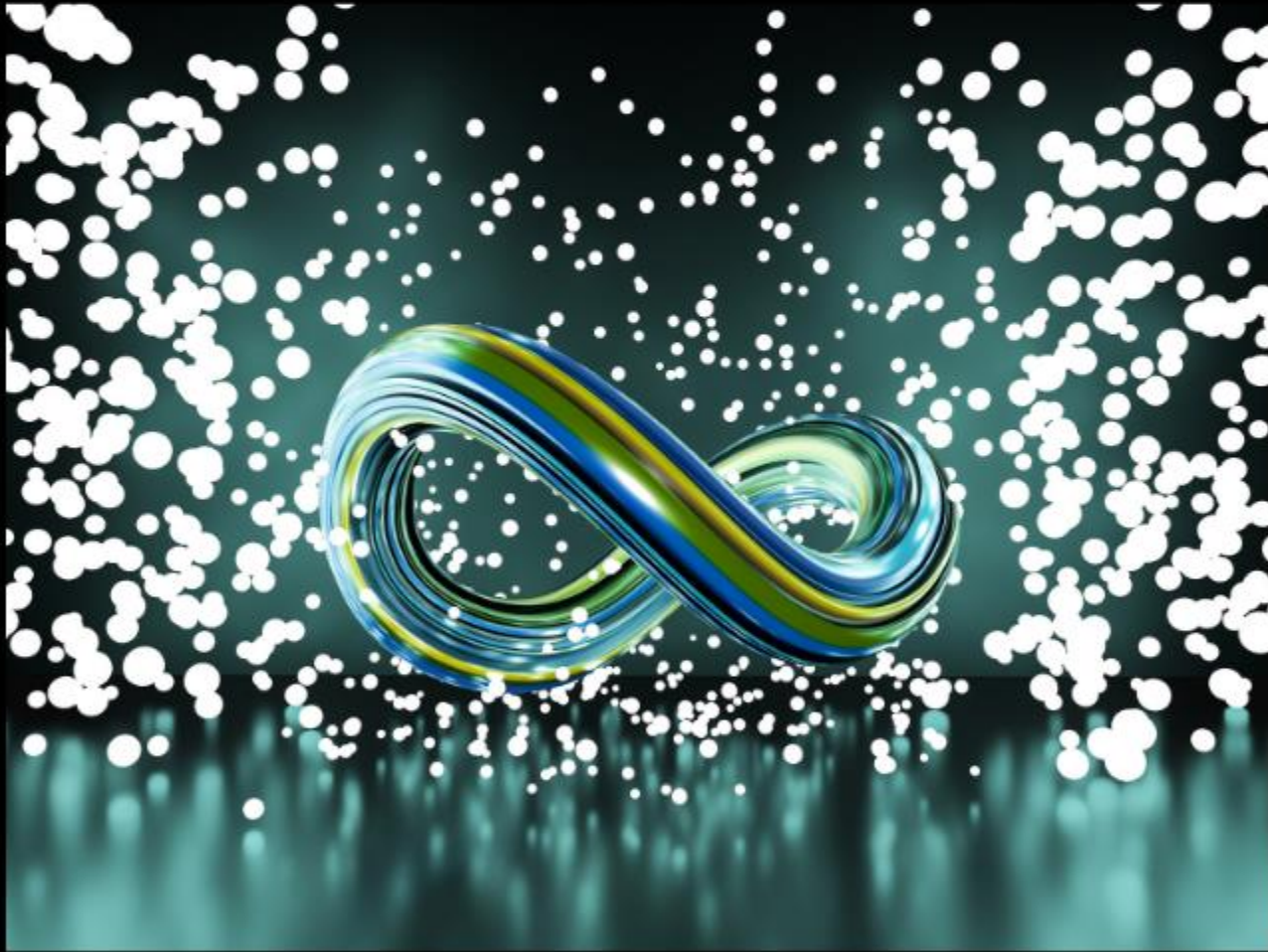
VARIOUS ACTIVES AND OTHER FUNCTIONAL INGREDIENTS

ethanol, hyaluronic acid, astaxanthin, ectoin, dihydroxyacetone, ...



According to Mintel, 28% of all skin care products launched between December 2018 and November 2019 contained fermented ingredients

ENDLESS POSSIBILITIES



ABOUT **ONE TRILLION (10^{12}) SPECIES OF MICROBES**
ON EARTH

99.999% have yet to be discovered

200,000-800,000 SPECIES OF MICROALGAE

only 50,000 described

VS ~400,000 SPECIES OF PLANTS

**MICROORGANISMS CAN BE FURTHER ENGINEERED,
CO-CULTURED (CONSORTIA)**

infinite source of metabolites

FERMENTATION

THE SUSTAINABILITY CHAMPION

SYNTHETIC PATHWAY



- 100% bio-based carbon
- Low footprint on land and nature
- Closed loop system
- Opportunity to use upcycled feed stock
- Lower energy consumption
- No need for solvents
- Resulting ingredients and by-products are both biodegradable
- Localised & on-demand production
- Not impacted by unpredictable weather, seasonality, climate change, political instability and supply chain disruptions
- Better yield and purity
- Biocompatibility



BOTANICAL EXTRACTION



 economical

CASE STUDY 1

α -BISABOLOL

Givaudan Bisabolife™



Multi-step reaction, using different solvents and acids

100% fossil-based carbon

mixture of the 4 α -bisabolol isomers containing only 25% of the active (-)- α -bisabolol.



Plant extraction from the bark of the Brazilian candeia tree.



1 ton of 12-year old trees = 7 kg of α -bisabolol

"Official" exploitation of sustainable forests not enough for global demand



100% of bio-based carbon

LCA shows reductions of 30% for CO₂ emission and 38% for renewable energy consumption compared to fossil synthetic pathways.

Requires approximately 230 times less agricultural land to produce compared to the candeia tree.

Purity of (-)- α -bisabolol higher than 99%.

CASE STUDY 2

SILK PROTEINS



B-Silk™ Protein

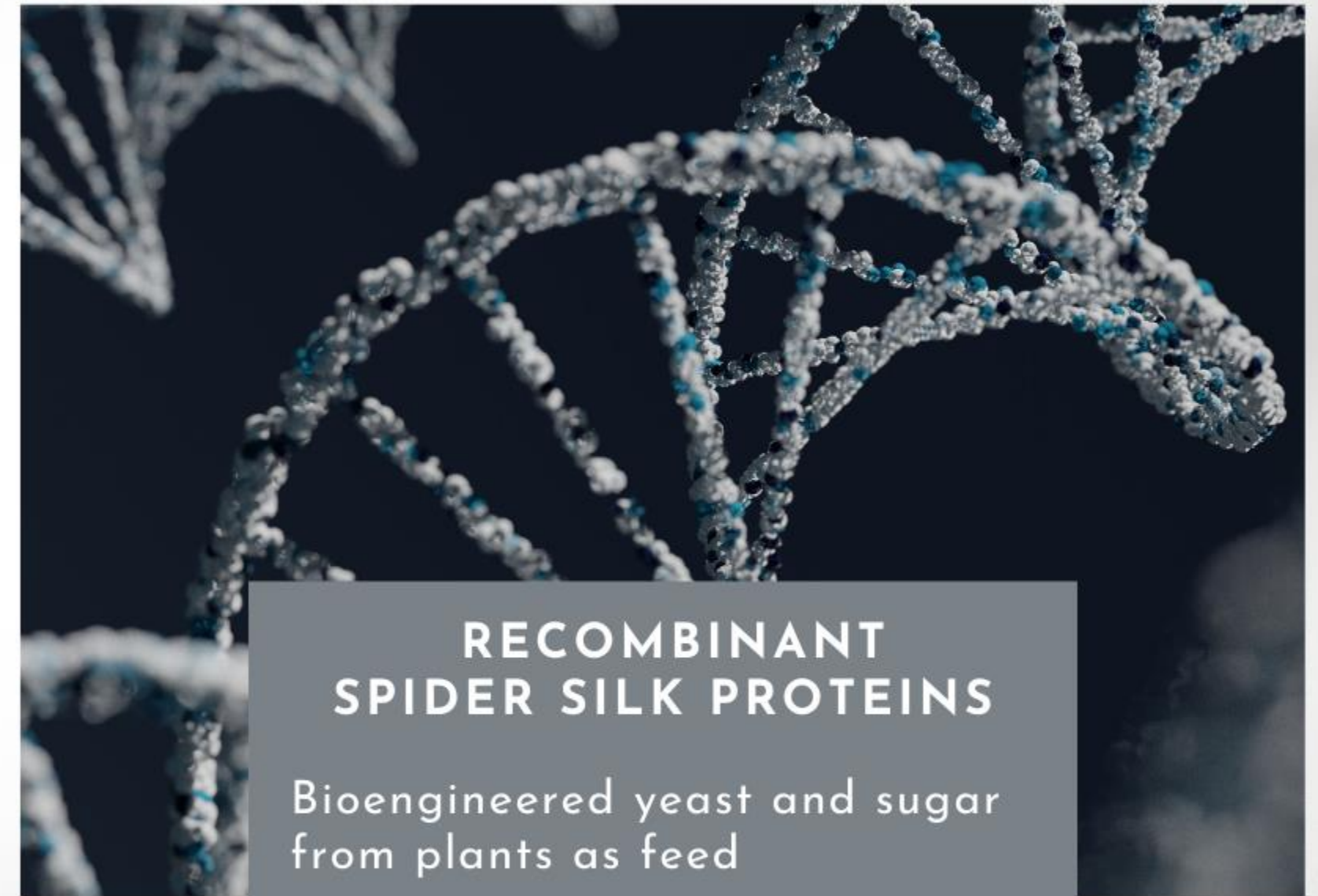


SILK

For just 1 kg

- 150 kg of mulberry leaves
- 6,600 silkworms boiled or gassed alive

Bonded labour and child labour still reported in sericulture in 2021



RECOMBINANT SPIDER SILK PROTEINS

Bioengineered yeast and sugar from plants as feed

- Non hydrolysed proteins
- High purity
- Outperforms hydrolysed silk
- Versatile and stable

THE PALM OIL ISSUE

70%
OF COSMETICS
CONTAIN PALM OIL
DERIVATIVES

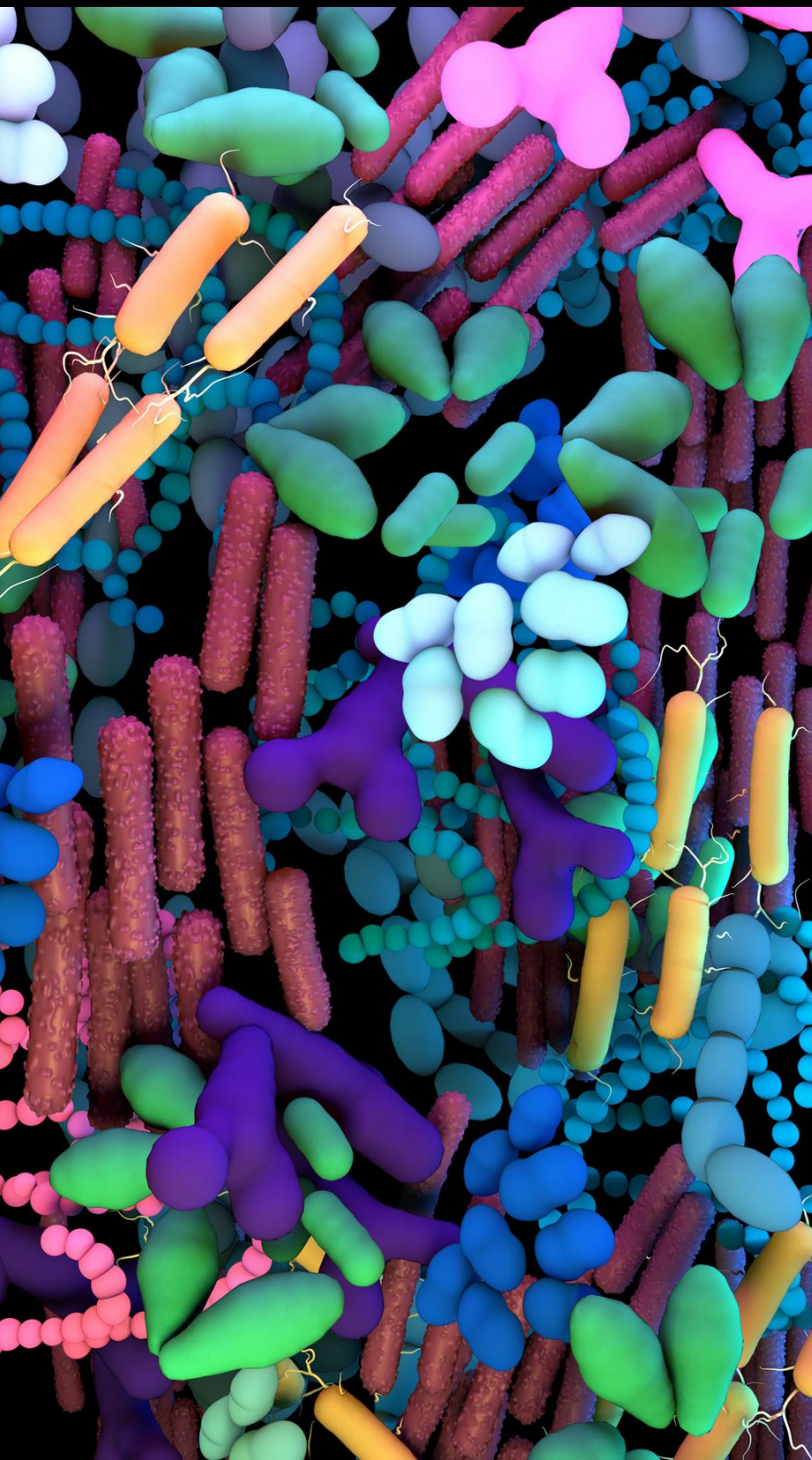


FERMENTATION AS PART OF THE SOLUTION

*14/01/22: 1st industrial-scale production of
biosurfactants rhamnolipids announced*



FERMENTATION MICROORGANISMS FOR THE SKIN MICROBIOME



1

PROBIOTICS

Cosmetics with live microorganisms likely to stay niche

2

POSTBIOTICS AS PREBIOTICS & ACTIVES

Ferment lysates as "food" for specific host microorganisms and skin cells
Traditional cosmetic ingredients fermented to increase their bioavailability and activity

- Labio Fermentoil series
- Adeka Majime Bio fruit ferment series
- Oat Cosmetics Aurafirm series

3

PROBIOTIC-LIKE

Heat-treated probiotics, with an intact membrane and metabolites content
Regulation of important skin microbiome pathways

- Symrise SymReboot™ L19 & SymReboot™ OC
- Roelmi EquiBiotics® LRh

THANK YOU

Fanny Coste

CEO, Cosmebiome Ltd
working with the Steering Committee of the

fanny@cosmebiome.com

fanny@ifsc2022.com



'WHERE BEAUTY, SCIENCE AND INNOVATION MEET!'

32nd IFSCC Congress
London 19–22 September 2022

www.ifsc2022.com



NEW YORK
Society of Cosmetic
CHEMISTS