CYCLOLAB

The Cyclodextrin Company

Mihály Bálint:

Cosmetic Applications

May 7, 2015

The defintion of cosmetics

According to the Regulation No 1223/2009 of the European Parliament and of the Council "cosmetic product": any substance or mixture intended to be placed **in contact with the external parts of the human body** (epidermis, hair system, nails, lips and external genital organs) or with the **teeth** and the **mucous membranes of the oral cavity** with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours.

The defintion of cosmetics

1. Notification – no authorisation!

•Latest at the time making the product available on the market
•Minimum information necessary for identification and Poison Centers

Compilation of Product Information File
with detailed manufacturing description, product safety report,
proof of the effects claimed!

The defintion of cosmetics

1. Notification – no authorisation!

2. Responsible person – manufacturer, importer, distributor

•Established within the Community

•Responsible person shall ensure compliance with the relevant obligations

•The holder of the Product Information File

The defintion of cosmetics

1. Notification – no authorisation!

2. Responsible person – manufacturer, importer, distributor

3. Special attention to CMR substances & nanomaterials

- Unknown risks
- The list of allowed ones with relevant restrictions to be determined and continuously updated

The defintion of cosmetics

1. Notification – no authorisation!

2. Responsible person – manufacturer, importer, distributor

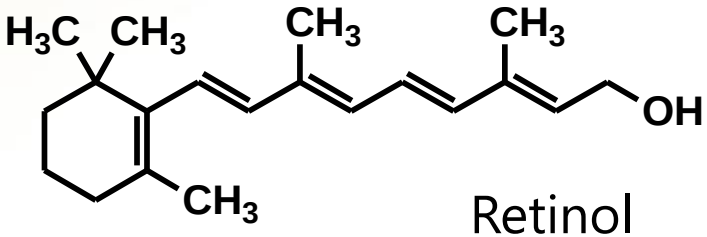
3. Special attention to CMR substances & nanomaterials

4. Law enforcement by competent authorities in given Member State (where the product is available on the market) <u>via market survaillance</u>

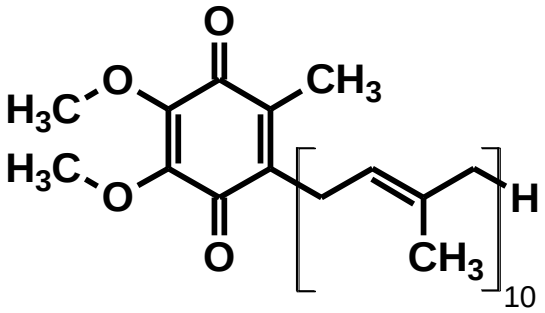
Advantages of complex formation

- Improvement of physical and chemical stability (volatile, oxygen-, light- and heat sensitive compounds)
- Reduction of undesirable tastes and odors

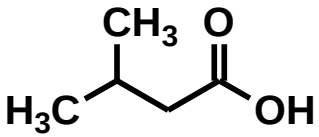
- Increased solubility in water
- Stable aqueous solutions of insoluble compounds can be prepared without the use of organic co-solvents or surfactants
- Enhanced rate of dissolution
- Improved wettability
- Liquids can be transformed into solid form
- Extended release of compounds
- Alleviation of local irritaions (reduced side effects)
- Enhanced absorption
- Incompatible compounds can be mixed and used together in complexed form
- Stabilization of emulsions and suspensions



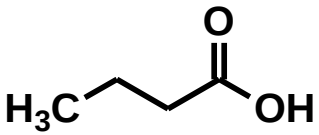
Retinol



Ubiquinone (Q10)



Isovaleric acid



Butyric acid

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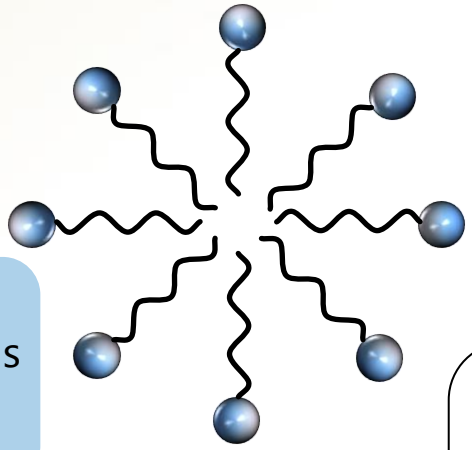

VS

Surfactants are already present in the majority of cosmetic products!

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Solid cosmetics are a peculiar field (powder): cyclodextrins have an important role here!

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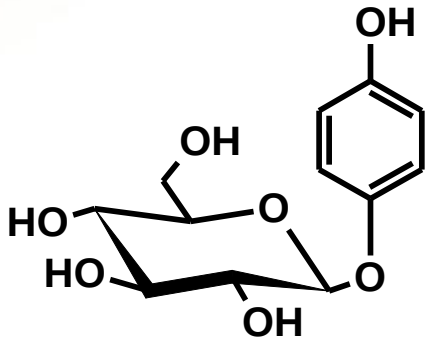
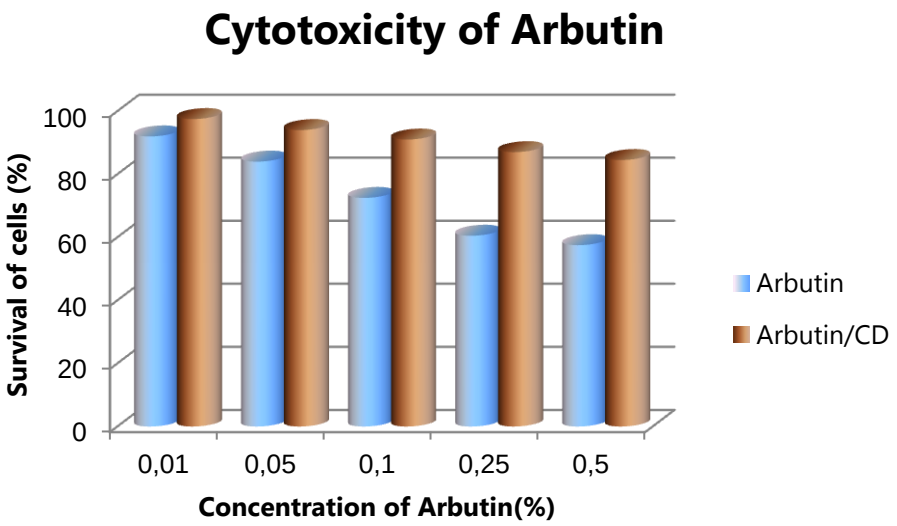


Arbutin



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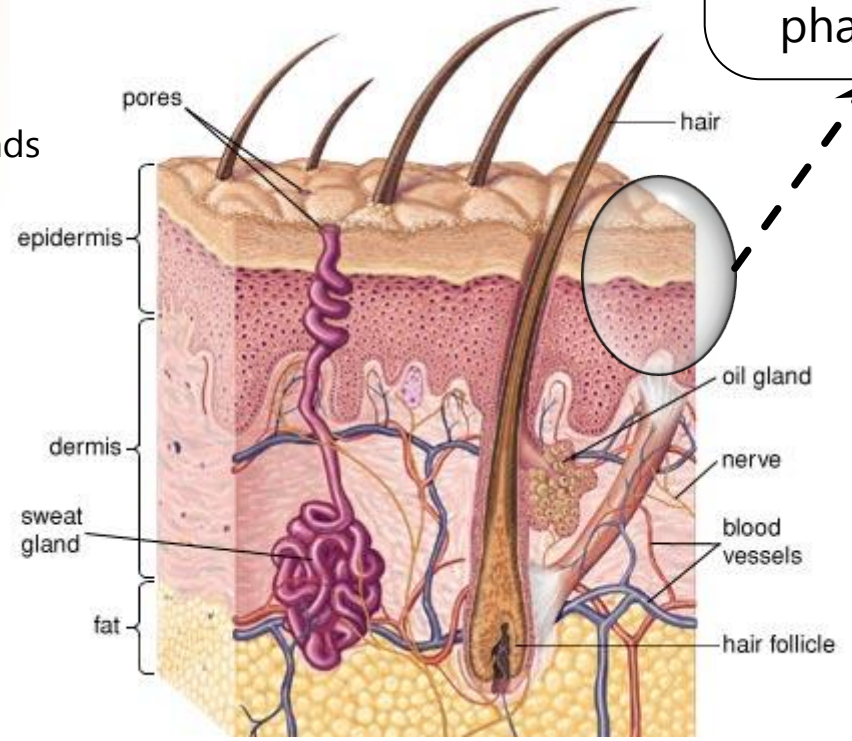
How far is cosmetics and from where is pharma?



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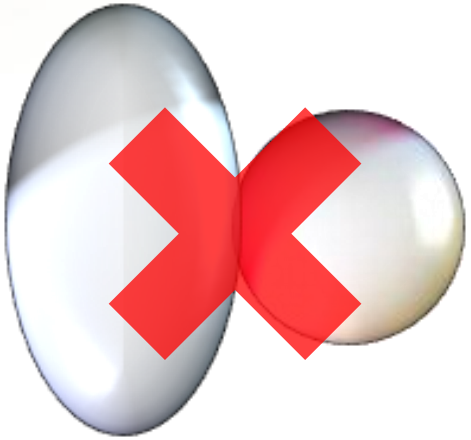

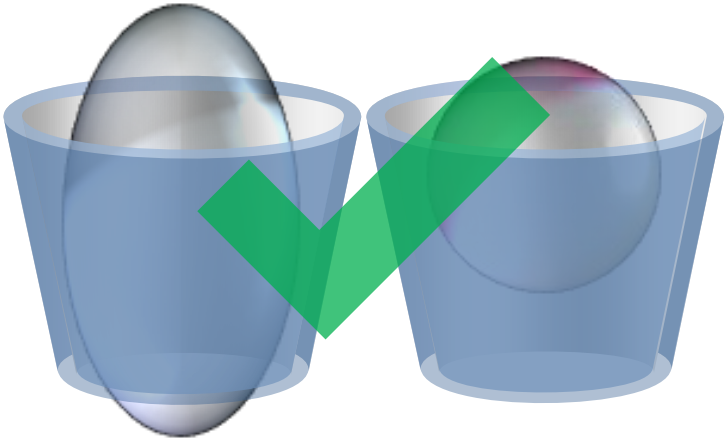

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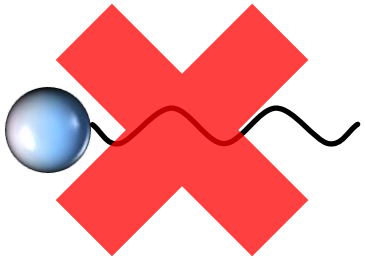


Regulatory background

Search Results

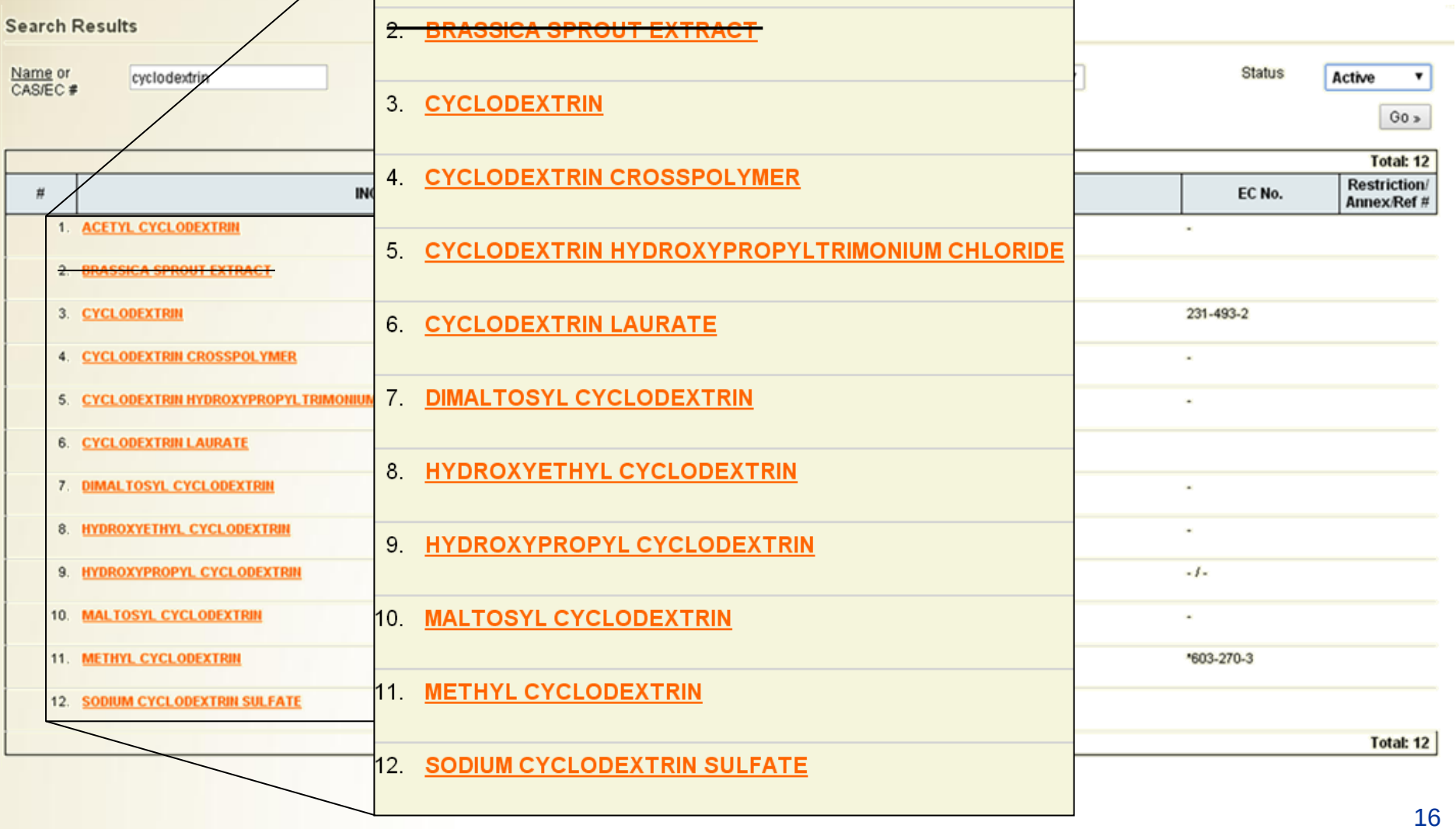
Name or CAS/EC # cyclodextrin | Version EC Regulation | Scope All | Status Active | Go »

Total: 12

#	INCI Name/Substance Name	CAS No.	EC No.	Restriction/ Annex/Ref #
1.	ACETYL CYCLODEXTRIN	-	-	
2.	~~BRASSICA SPROUT EXTRACT~~			
3.	CYCLODEXTRIN	7585-39-9 / 12619-70-4	231-493-2	
4.	CYCLODEXTRIN CROSSPOLYMER	-	-	
5.	CYCLODEXTRIN HYDROXYPROPYL TRIMONIUM CHLORIDE	-	-	
6.	CYCLODEXTRIN LAURATE			
7.	DIMALTOSYL CYCLODEXTRIN	-	-	
8.	HYDROXYETHYL CYCLODEXTRIN	-	-	
9.	HYDROXYPROPYL CYCLODEXTRIN	128446-33-3 / 128446-35-5	- / -	
10.	MALTOSYL CYCLODEXTRIN	104723-60-6	-	
11.	METHYL CYCLODEXTRIN	128446-36-6	*603-270-3	
12.	SODIUM CYCLODEXTRIN SULFATE	37191-69-8		

Total: 12

Regulatory background



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Production basics

Phase	Ingredient	%	Comment
	Aqua	80,6	-
A	Edeta BD	0,3	chelating
	Carbopol 980	0,5	gel forming
	Lanette 16	1,8	emollient
	Lanette D	2,4	emollient
	Eumulgin B2	2,0	emulsifying
	Cutina GMS-SE	1,5	emulsifying
	Cetiol 868	1,0	emollient
B	Propylene glycol	1,0	solvent
	Isopropyl myristate	1,0	emollient
	Cetiol SB 45	0,5	skin conditioning
	Jojoba oil	0,6	-
	Almond oil	0,4	-
	Uvinul MC 80	5,0	UV filter
	Microcare PE	1,0	preservative
C	Vitamin E acetate	0,2	-
	D-Panthenol	0,2	-
D	TEA	*q.s.*	pH adjuster

Phase "A": water phase with all water soluble non heat-sensitive components
Phase "B": oil phase with all oil soluble non heat-sensitive components
Phase "C": heat-sensitive components either pre-mixed or separately
Phase "D": components necessary for setting the pH, no pre-determined amounts

Production basics

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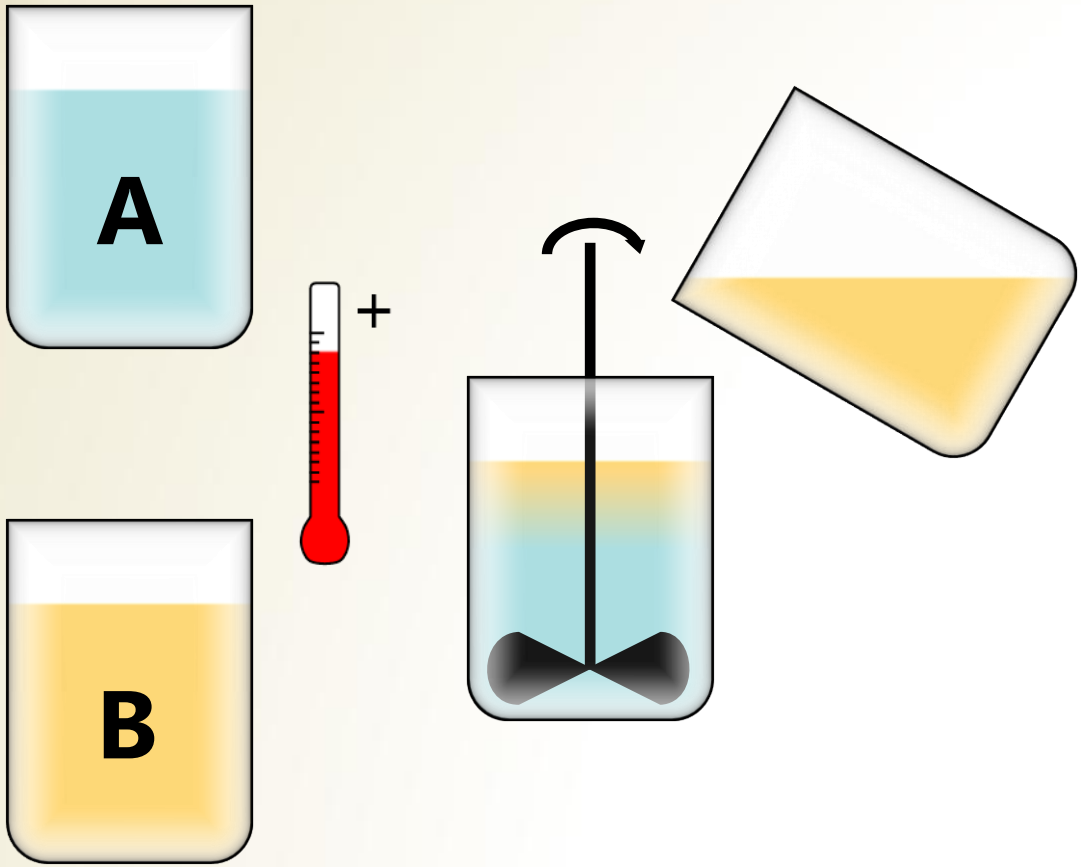

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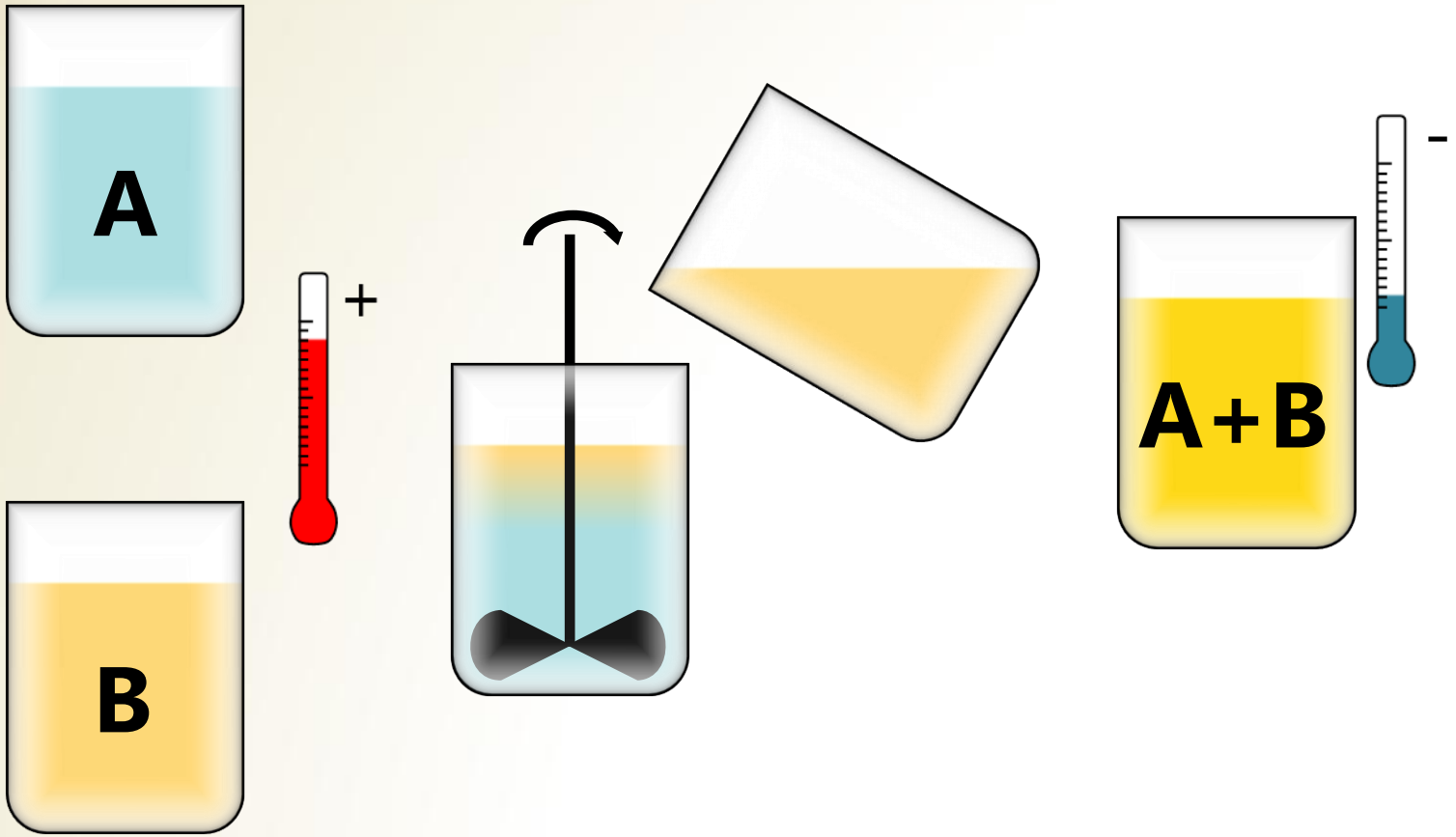

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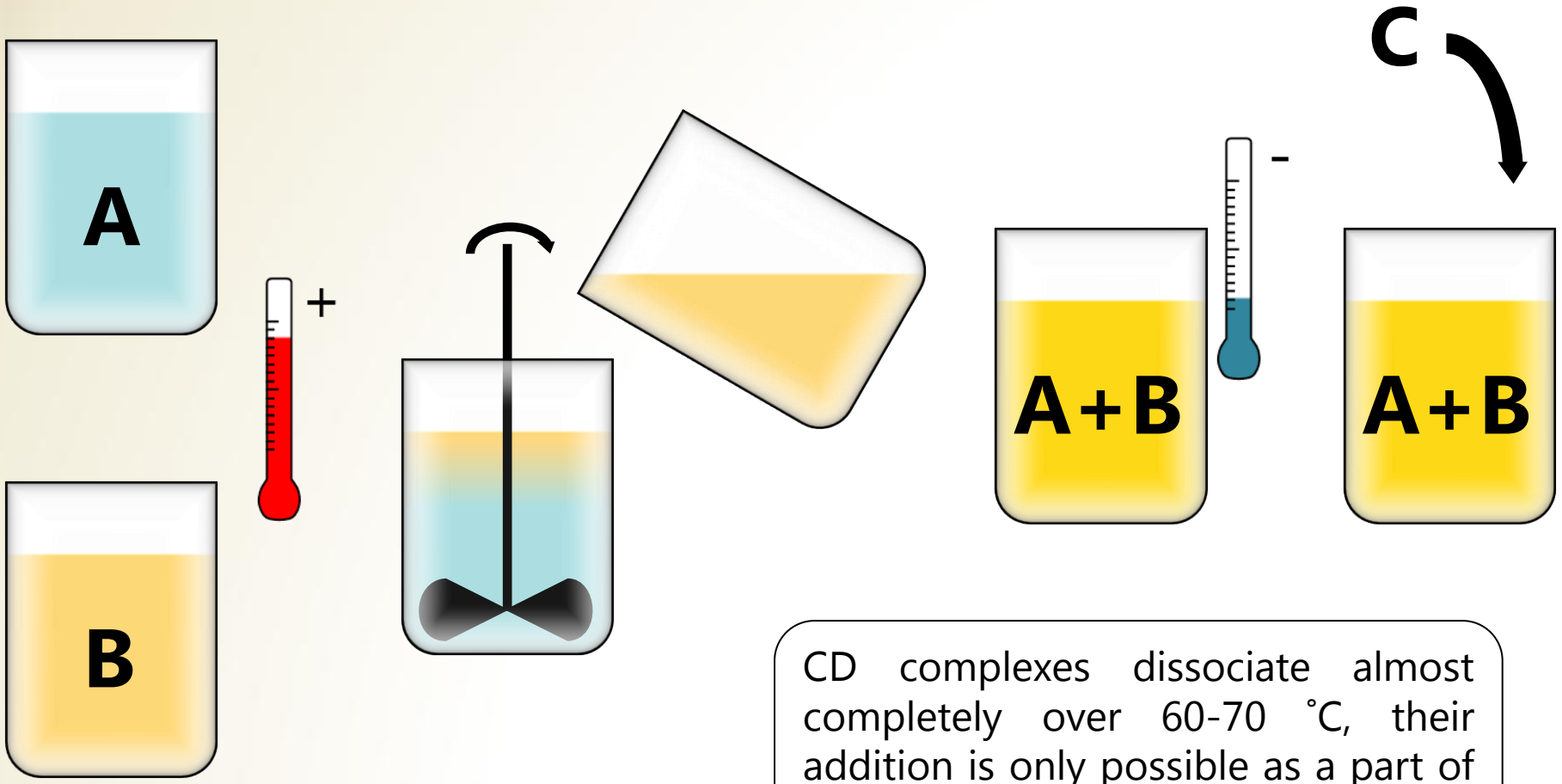
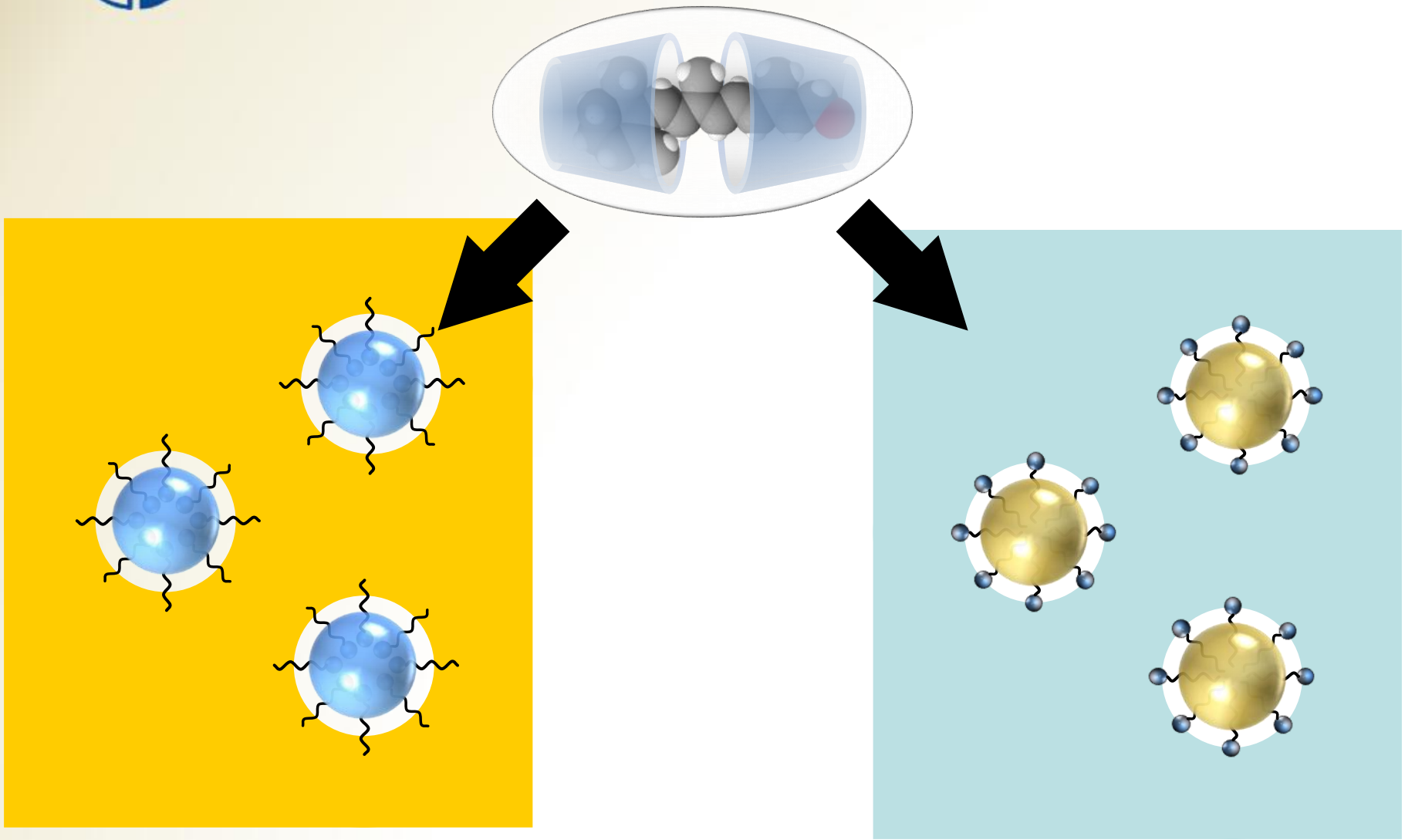


CD complexes dissociate almost completely over 60-70 ˚C, their addition is only possible as a part of phase "C"!

Limitations, problems



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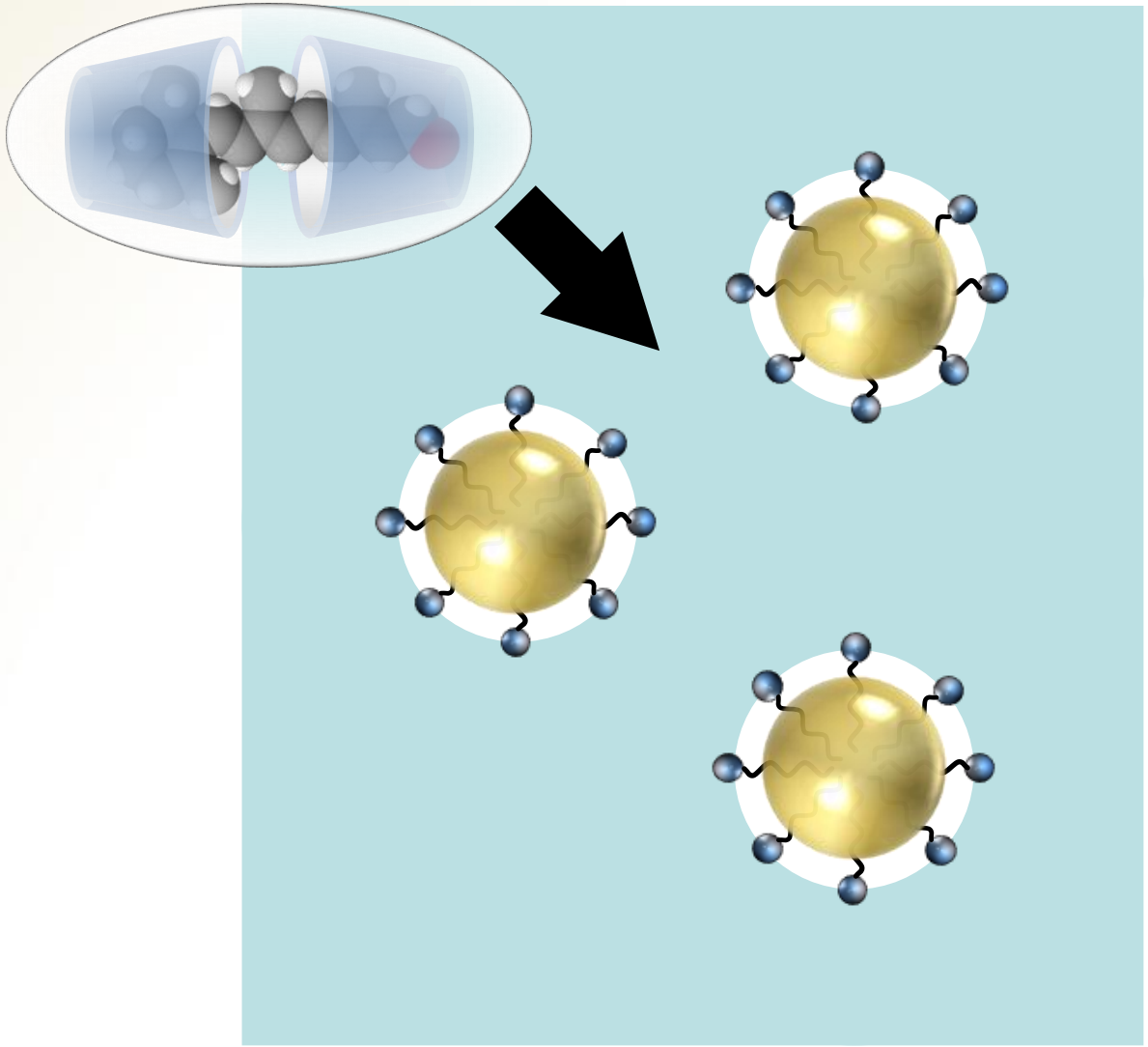

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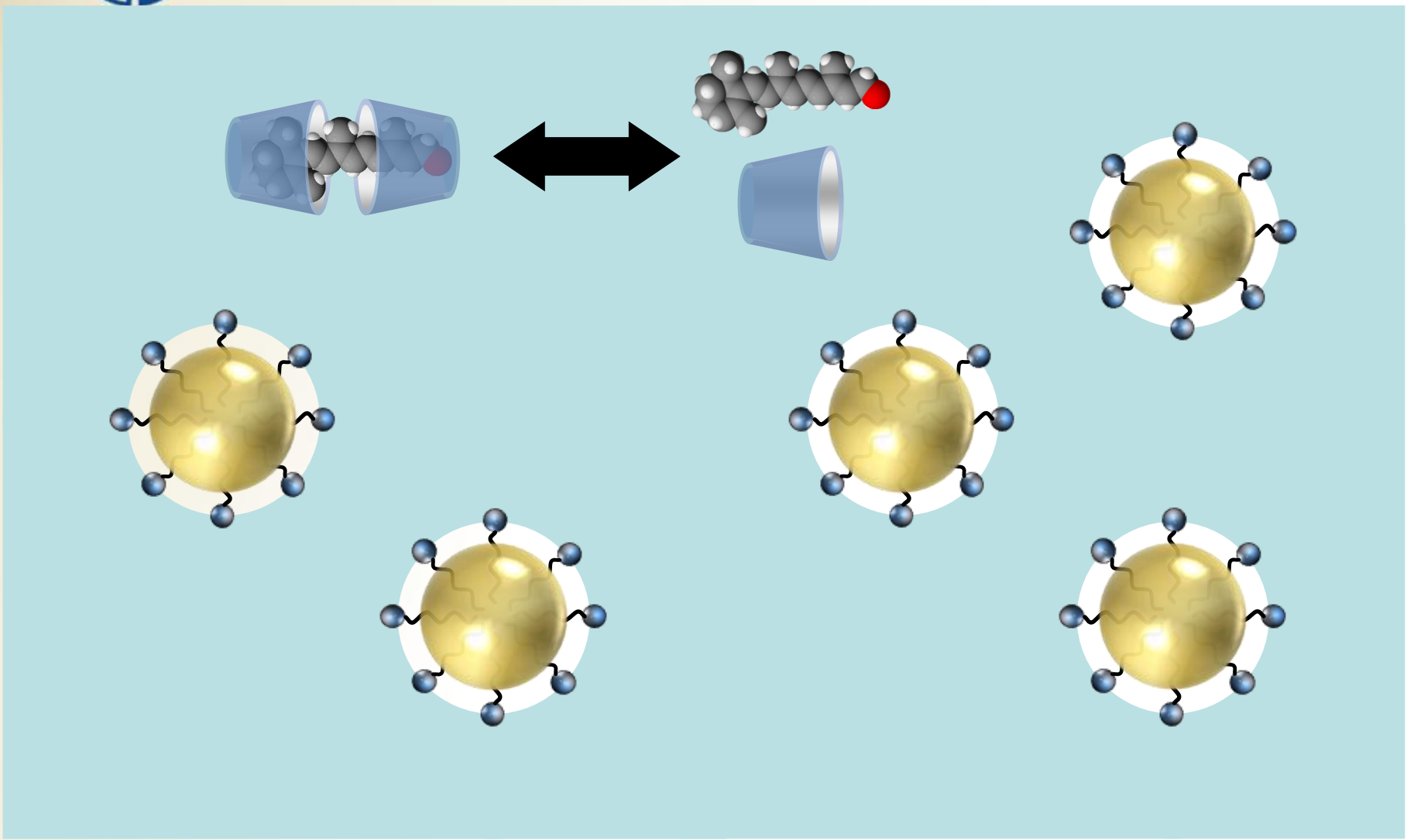

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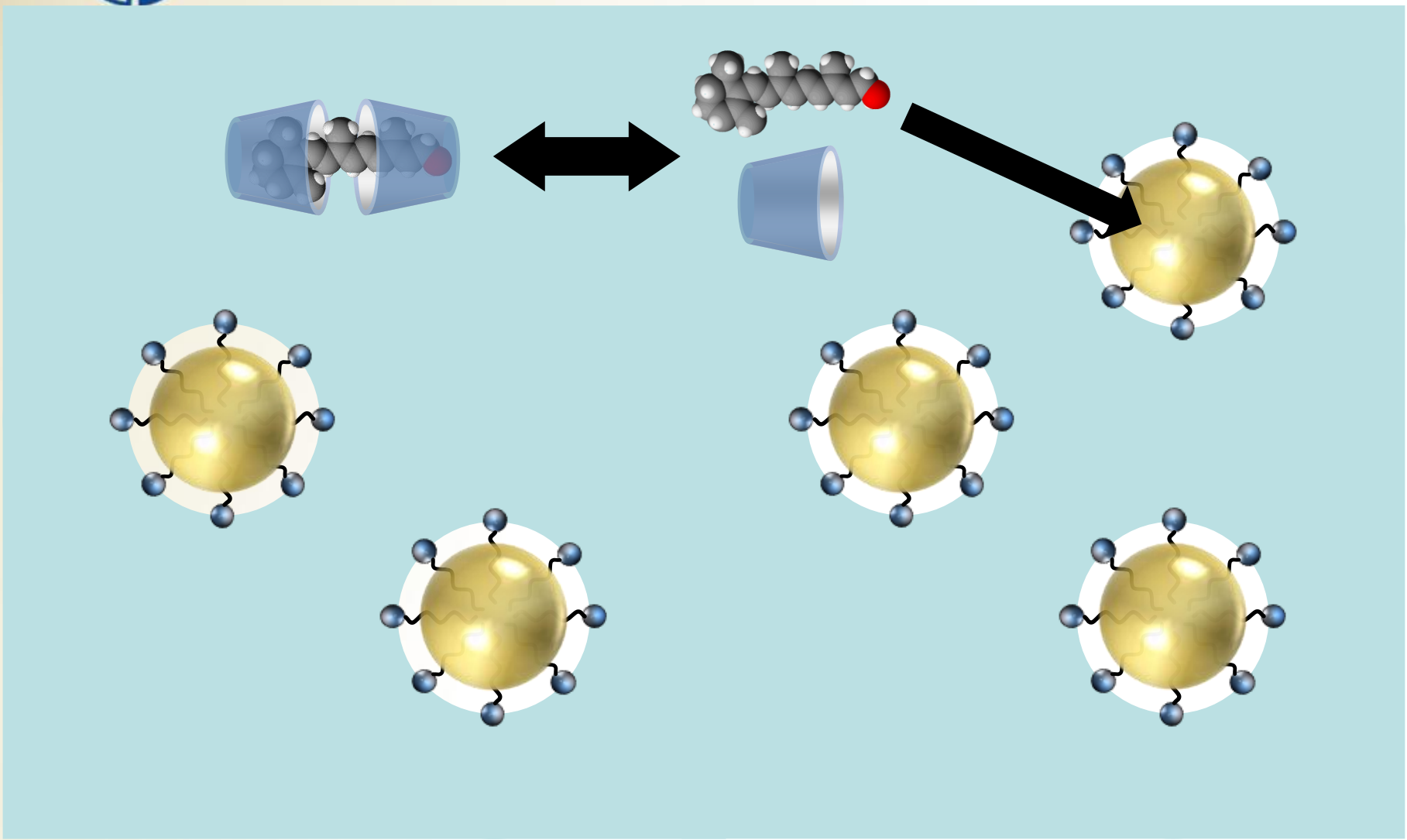

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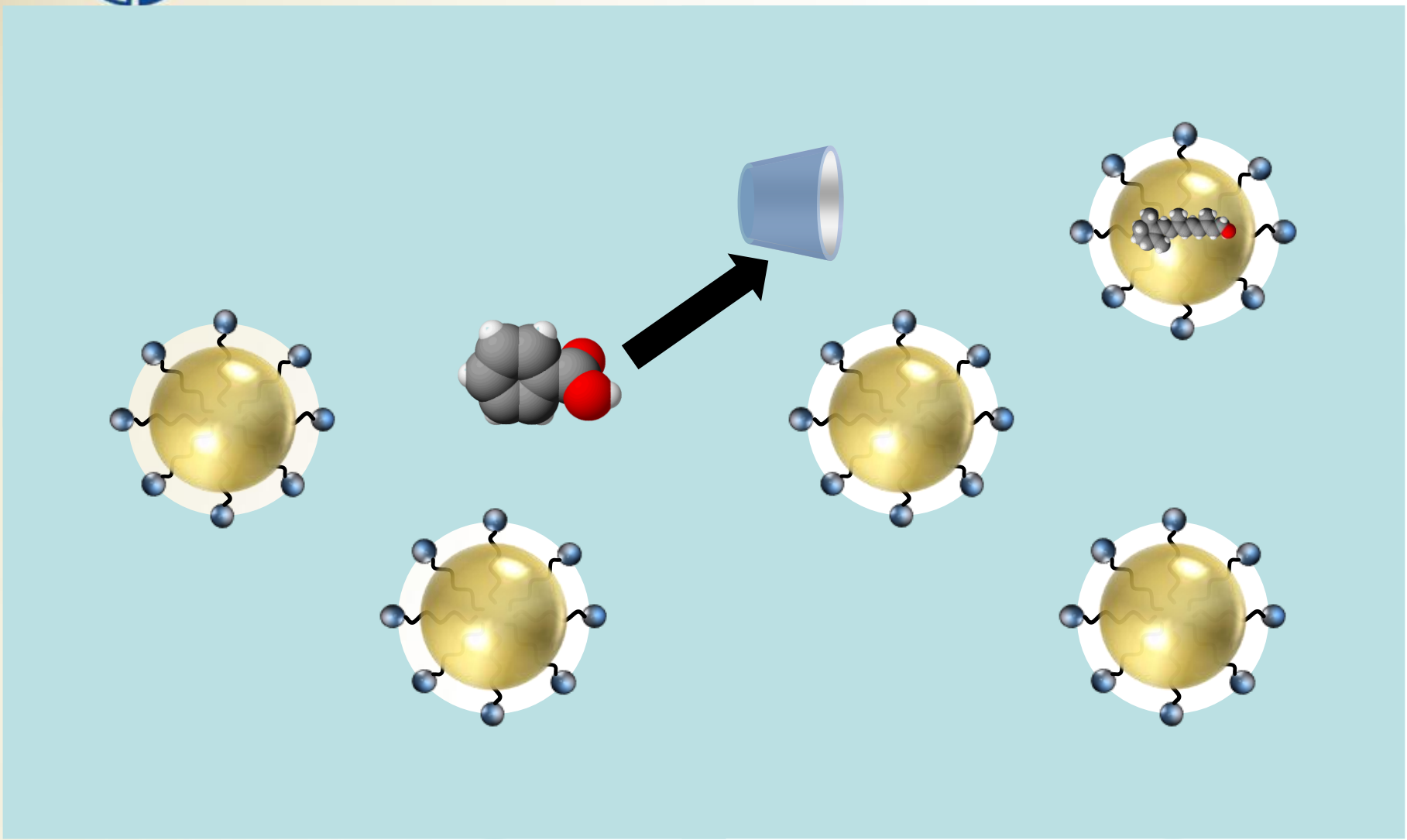

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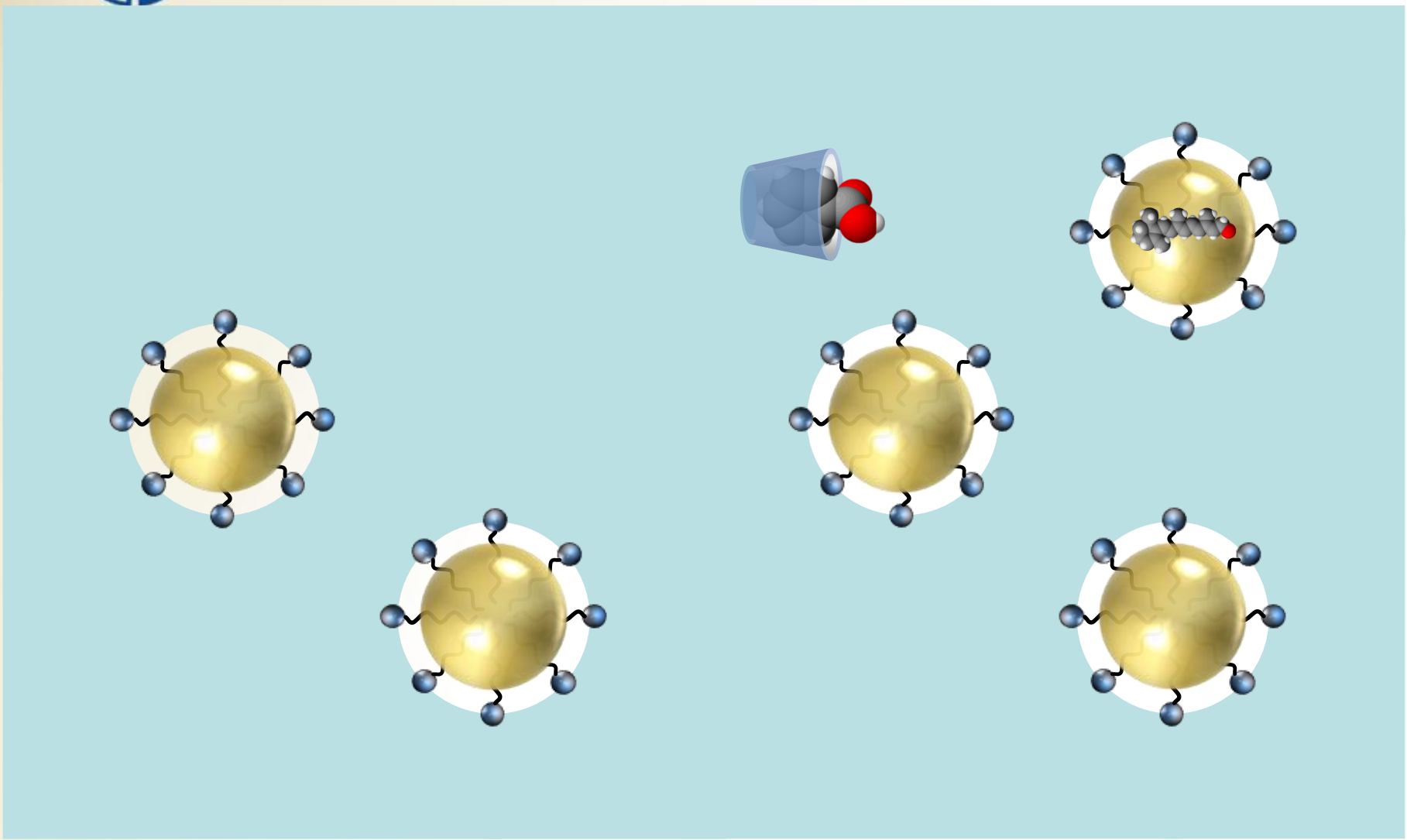

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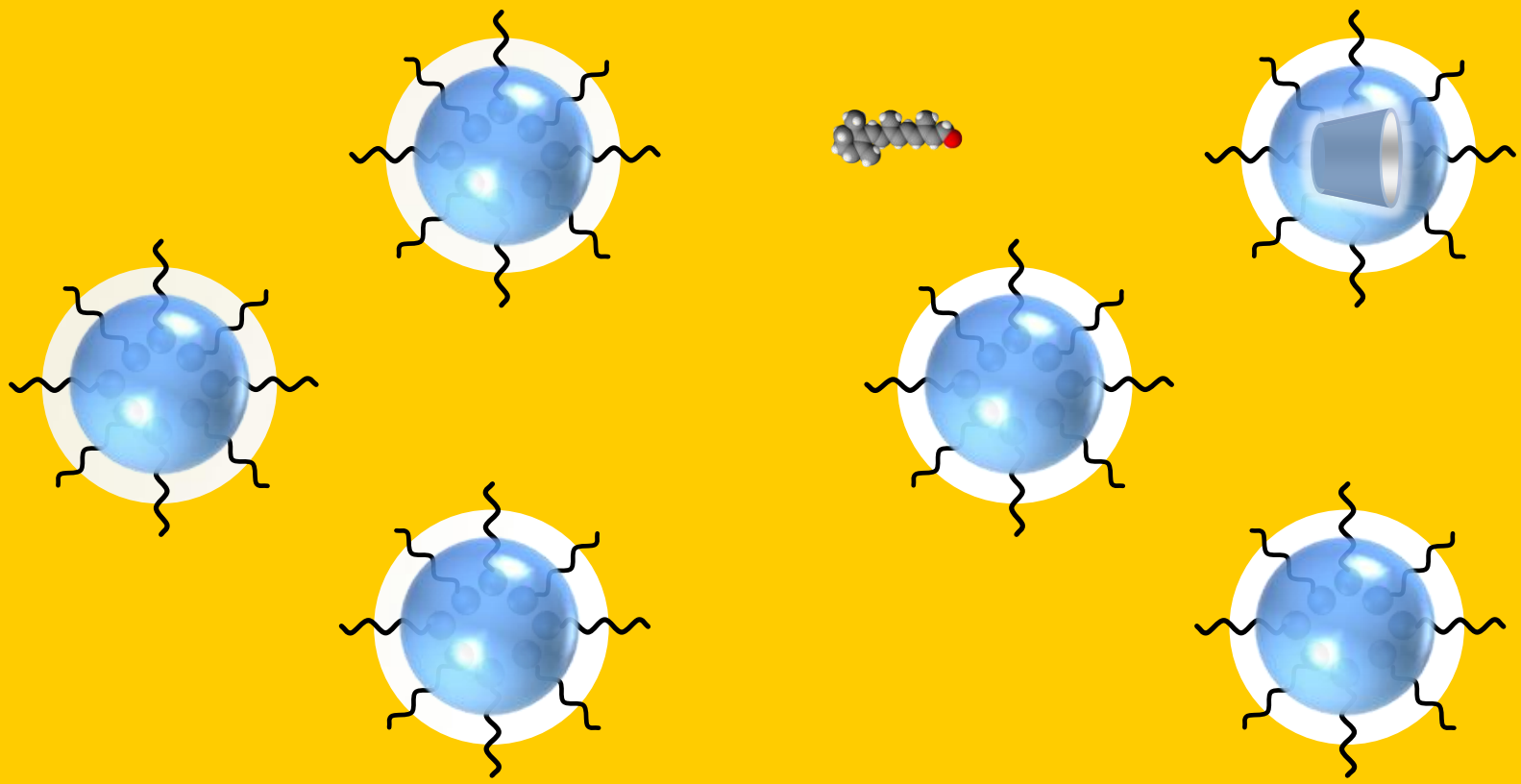
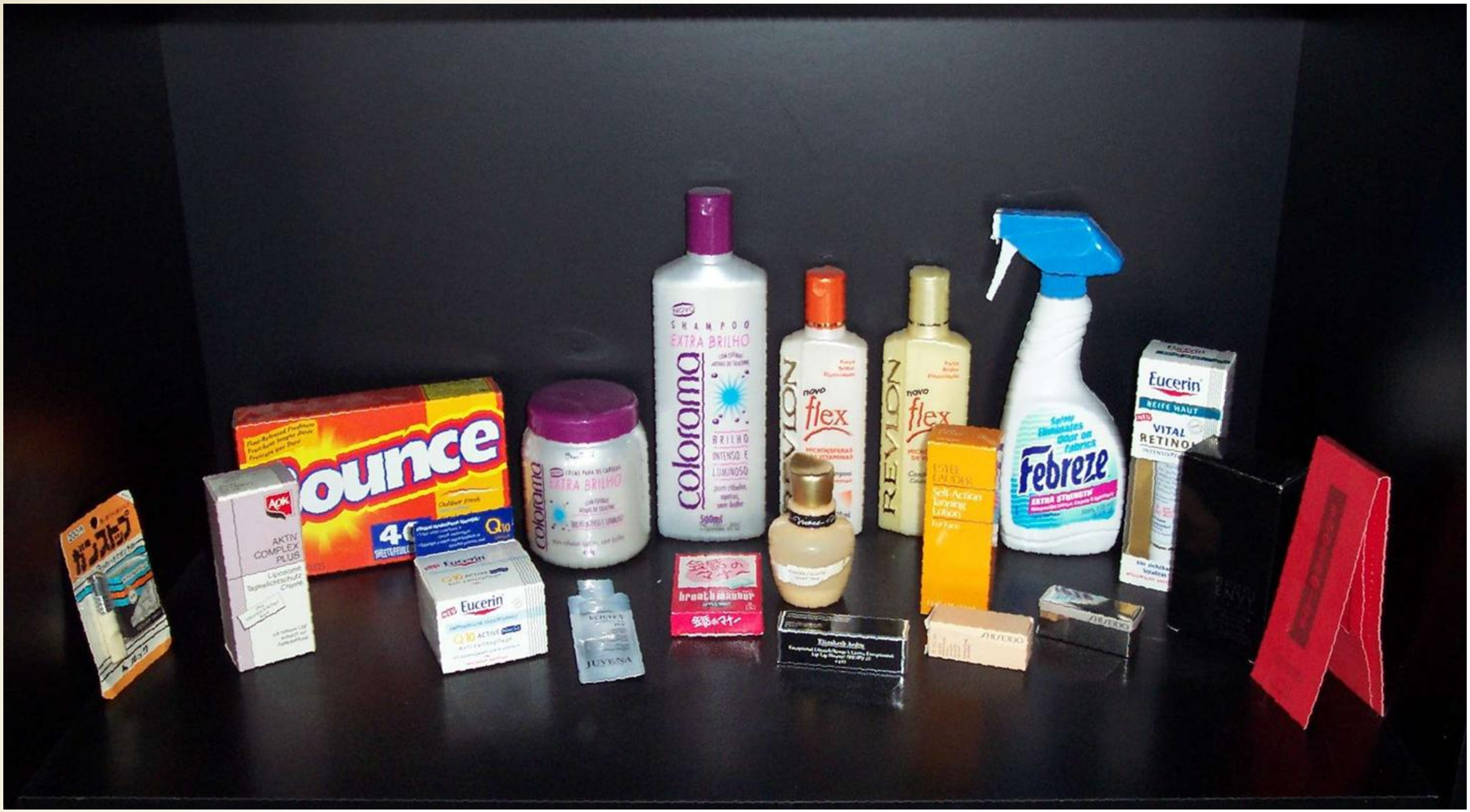


CYCLOLAB

Reality



Reality

Water / Aqua, Butylene Glycol, Biosaccharide Gum-1, **Cyclodextrin**, Salicylic Acid, Panicum Miliaceum Glycoprotein Extract, Aloe Barbadensis (Aloe Vera) Extract, Arginine, PEG-10 Soya Sterol, Ceteth-20, Dimethicone, Ceteth-2, Dimethicone Copolyol, Hexadecanol, Methylparaben, Green 5 / CI 61570, Yellow 10 / CI 47005

Reality

Olive Fruit Oil, Vaseline, Mineral Oil, Diisostearyl Malic Acid, Ceresin, Hydrogenated Kokoguriseriru, Hexa-hydroxy Stearic Acid Dipentaerythrityl, Tri(Caprylic/Capric Acid) Glyceryl, Ethylhexyl Methoxycinnamate, **Cyclodextrin**, Polyethylene, Dimethicone, Squalane, Tocopherol Acetate, Isotridecyl Isononanoate, Microcrystalline Wax, Fragrance, Silica, t-Butylmethoxydibenzoylmethane, BHT, (+/-) 4 Yellow, Blue 1, Red 201

Reality

Peg-115M, PVP, Peg-100, **Cyclodextrin**, Tocopherol, Aloe Barbadensis (Aloe Vera), Maltodextrin

Reality

Alcohol Denat., Water / Aqua, Parfum / Fragrance, **Methyl Cyclodextrin**, BHT, Butylphenyl Methylpropional, Citral, Citronellol, Diethylamino Hydroxybenzoyl Hexyl Benzoate, Ethylhexyl Methoxycinnamate, Eugenol, Geraniol, Limonene, Linalool

Reality

Water / Aqua, Glycerin, Dipropylene Glycol, Phenyl Trimethicone, Ethylhexyl Methoxycinnamate, Alcohol, Octocrylene, Xylitol, Butylene Glycol, Peg/Ppg-14/7 Dimethyl Ether, Scutellaria Baicalensis Root Extract, **Hydroxypropyl Cyclodextrin**, Mentha Piperita (Peppermint) Leaf Extract, Sodium Hyaluronate, Citrus Junos Seed Extract, Phytosteryl Macadamiate, Behenyl Alcohol, Stearic Acid, Glyceryl Stearate SE, Isostearic Acid, Behenic Acid, Beheneth-20, Carbomer, Trisodium EDTA

Reality

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS (PCT)

(19) Organisation Mondiale de la Propriété Intellectuelle
Bureau international

(43) Date de la publication internationale
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PCT

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(22) Date de dépôt international : 17 avril 2003 (17.04.2003)

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(26) Langue de publication : français

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(71) Déposant *(pour tous les États désignés sauf US)* : **L'OREAL** [FR/FR]; 14, rue Royale, F-75008 Paris (FR).

(72) Inventeur; et
(75) Inventeur/Déposant *(pour US seulement)* : **MÜLLER, Rainer** [DE/DE]; Fichtenweg 2, D-76344 Leopoldshafen (DE).

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(81) États désignés *(national)* : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) États désignés *(régional)* : brevet ARIPO (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), brevet eurasien (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), brevet européen (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), brevet OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Publiée :
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— *avant l'expiration du délai prévu pour la modification des revendications, sera republiée si des modifications sont reçues*

En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

(54) **Title:** USE OF CYCLODEXTRINE AS A PEARLY-LUSTRING AGENT AND PEARLY LUSTRED COMPOSITIONS

(54) **Titre :** UTILISATION D'UNE CYCLODEXTRINE EN TANT AGENT NACRANT ET COMPOSITIONS NACREES

(57) **Abstract:** The invention relates to the use of at least one cyclodextrine as a pearly-lustring agent in a cosmetic composition in an aqueous physiologically acceptable medium. The invention also relates to pearly-lustred compositions comprising at least one cyclodextrine and at least one surfactant in an aqueous physiologically acceptable medium. The invention further relates to pearly-lustred compositions comprising at least one cyclodextrine, at least one surfactant and at least one conditioning agent in an aqueous physiologically acceptable medium. The invention also relates to the use of said cyclodextrine as a suspension agent for insoluble conditioning agents. The inventive compositions are used in particular as rinsed products for washing and/or conditioning keratin materials.

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(57) Abstract: The invention relates to the use of at least one cyclodextrine as a pearly-lustring agent in a cosmetic composition in an aqueous physiologically acceptable medium. The invention also relates to pearly-lustred compositions comprising at least one cyclodextrine and at least one surfactant in an aqueous physiologically acceptable medium. The invention further relates to pearly-lustred compositions comprising at least one cyclodextrine, at least one surfactant and at least one conditioning agent in an aqueous physiologically acceptable medium. The invention also relates to the use of said cyclodextrine as a suspension agent for insoluble conditioning agents. The inventive compositions are used in particular as rinsed products for washing and/or conditioning keratin materials.

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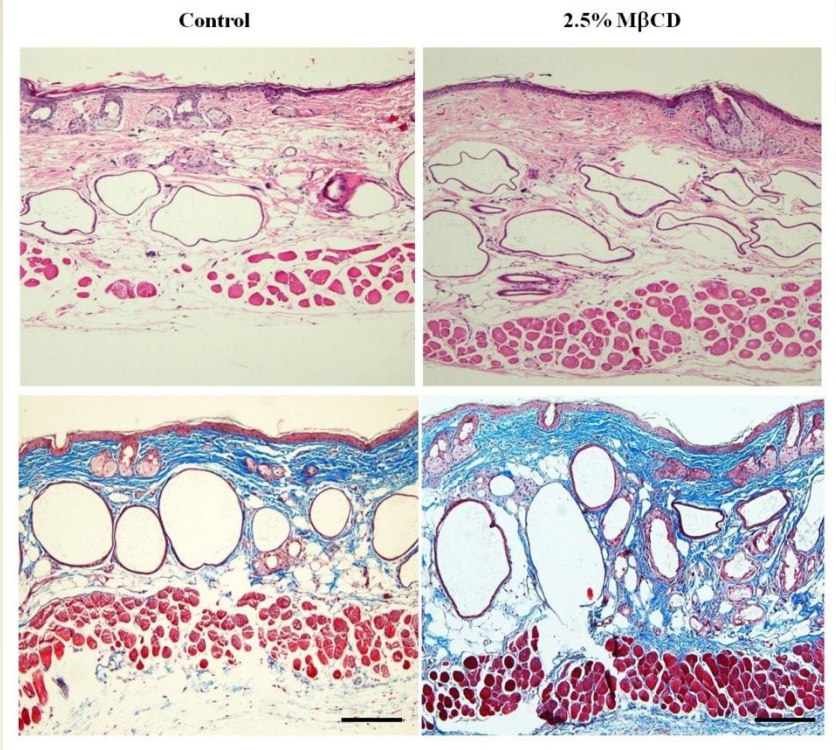
Future prospects



H & E (upper panel) and Masson's trichrome (lower panel) stains for skin samples were performed from 2.5% MβCD-injected and control groups (n=3 for both groups). Bar = 20 μm.

•Caveolin-1 (Cav-1) is one of the key molecules to modulate collagen metabolism in the skin with a negative correlation between Cav-1 and collagen I (COL I).

•Methyl-βCD is a known chemical Cav-1 inhibitor.

•Methyl-βCD injection via the intra-dermal route revealed that 2.5% MβCD administered twice per week for two months showed a potent COL I-up-regulating activity, leading to the increase of skin thickness ($P < 0.05$) without adverse reactions such as skin fibrosis.

•Collectively, Methyl-βCD has a COL I-enhancing activity in chronologically-aged skin, where Cav-1 acts as a brake in COL I expression, suggesting its potential role for an anti-aging agent.

Lee, J-A.; Choi, D-I.; Choi, J-Y.; Kim, S-O.; Cho, K-A.; Lee, J-B.; Yun, S-J.; Lee, S-C. (2015) Methyl-β-cyclodextrin up-regulates collagen I expression in chronologically-aged skin via its anti-caveolin-1 activity. Oncotarget., 6(4), 1942-1953.

Thank you for your attention!