



# Future of Bio-based Polymers and Raw materials for the cosmetic Industry

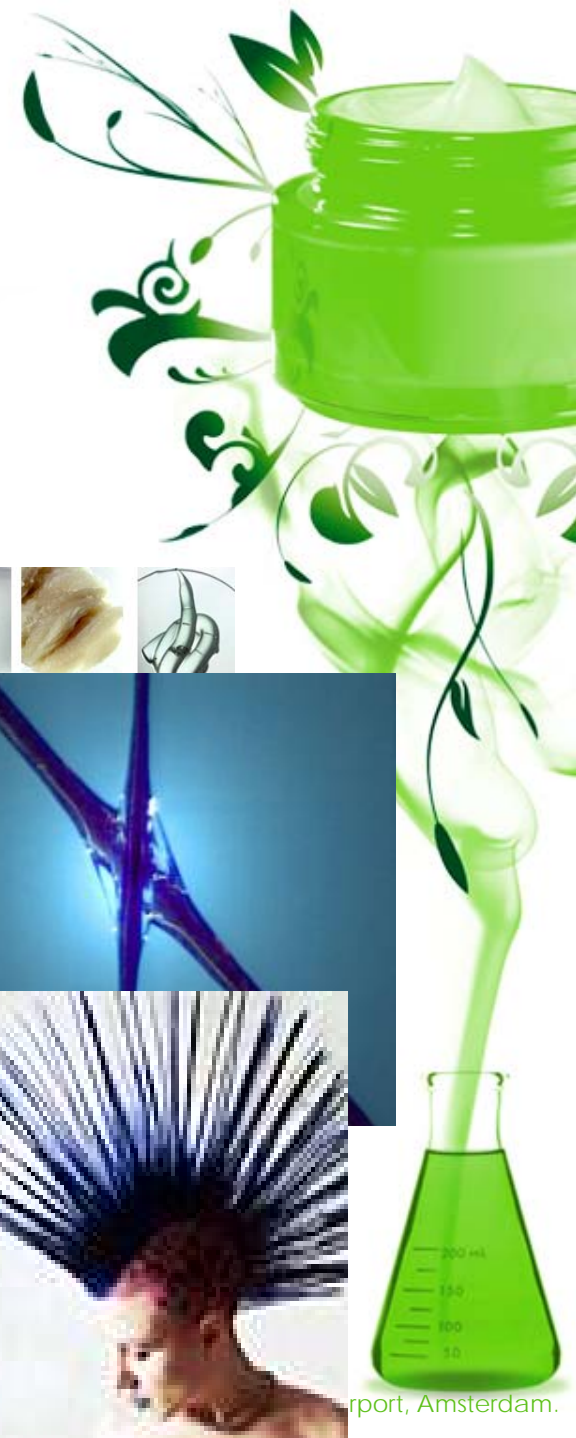
**Bio-based polymers workshop**  
**12<sup>th</sup> October 2010, Schiphol Airport,**  
**Amsterdam**

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**L'Oréal, Advanced Research**  
**Chemistry and Performance Material Dpt Director**



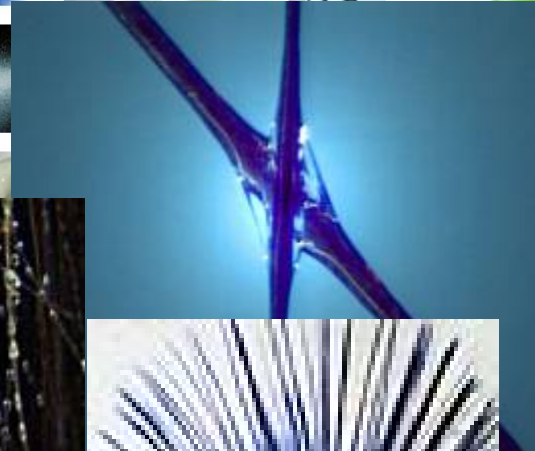


## Polymers in cosmetics



# Polymers: The most widely used ingredients in cosmetics

- Rheology modifiers
  - Shampoos, creams, gels, mousses, sticks
- Emulsifiers, dispersing agents
  - Pigment dispersion
- Encapsulation
  - Ingredients delivery and protection
- Film forming
  - Nail varnish, hair styling
- Adhesives
  - Hair sprays



# Polymers in cosmetics

- *Shampoos and conditioners*, where polyelectrolyte's dynamics drive its properties in a solution or when *adsorbed* by hair and skin
- *Hair setting or nail polish* products, where the *adhesive*'s dissipative effects at the interface control its performance
- *Gel and cream formulations*, where entanglements and disentanglements occur, are the base of understanding their *rheological* properties
- *Colloids and coatings formulations* where *wetting* phenomena play an essential role.





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## Our Context

**A high portion of the portfolio of l'Oréal's raw materials including internal R&D and external suppliers are plant origin :**

**in 2008, 40 % of raw materials were sourced from plants**

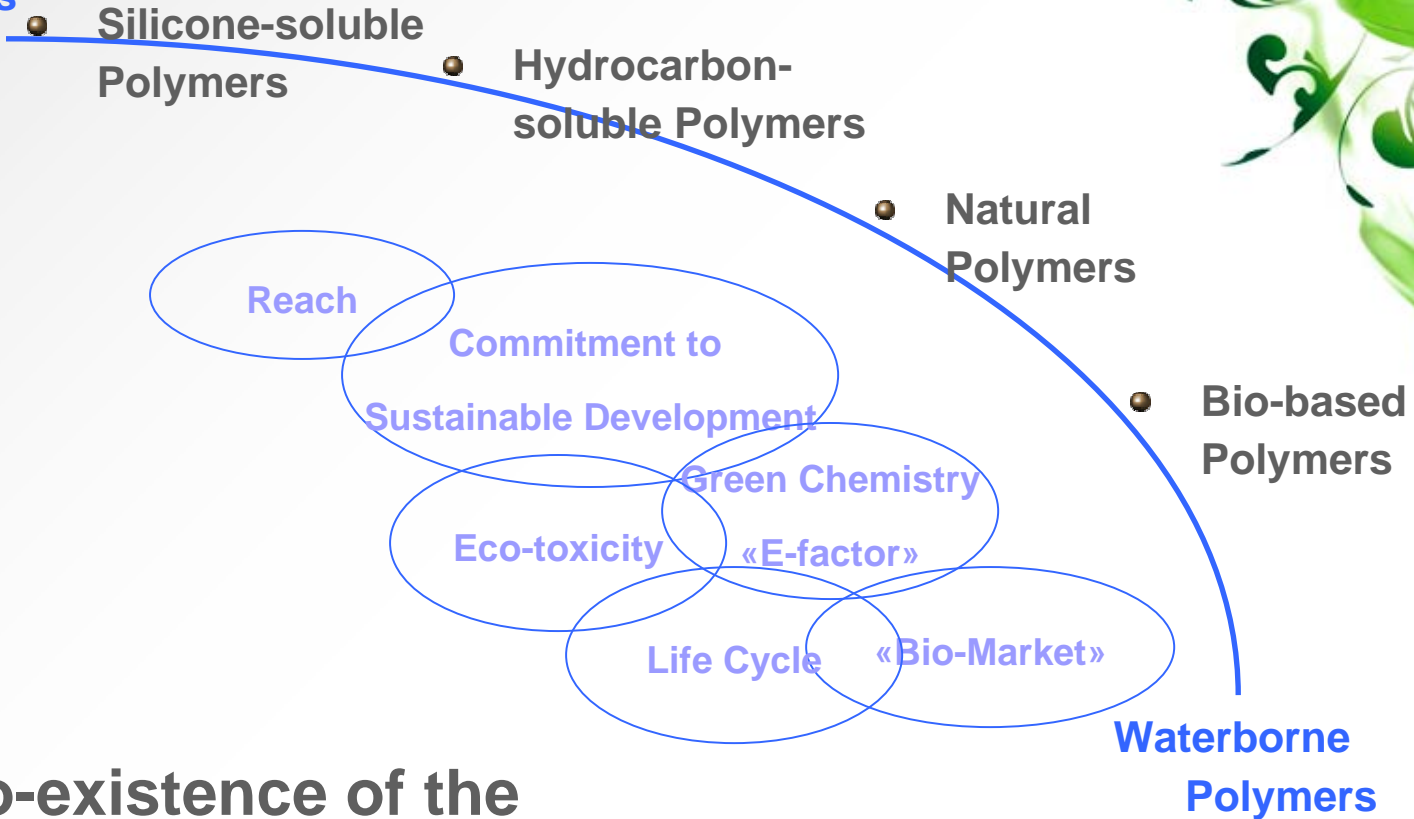
### But Why...?



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## Our Context

Solvent borne  
Polymers



Co-existence of the diversity...but a new trend anyway...



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## Our Challenges/Goals

- ❑ Safe and Eco-safe Water-based Polymers : Latexes
- ❑ Polymers from Renewable Ressources :
  - $\%C_{Ren.} > 50\%$
  - Water-dispersible
  - or also...Oil-solubleProperties : Film-formers, Gels
- ❑ Composite Materials : Ex. Natural Fillers
- ❑ Green eco-friendly surfactants
- ❑ Green Solvents and cosmetic oils





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## Research themes to reach these goals

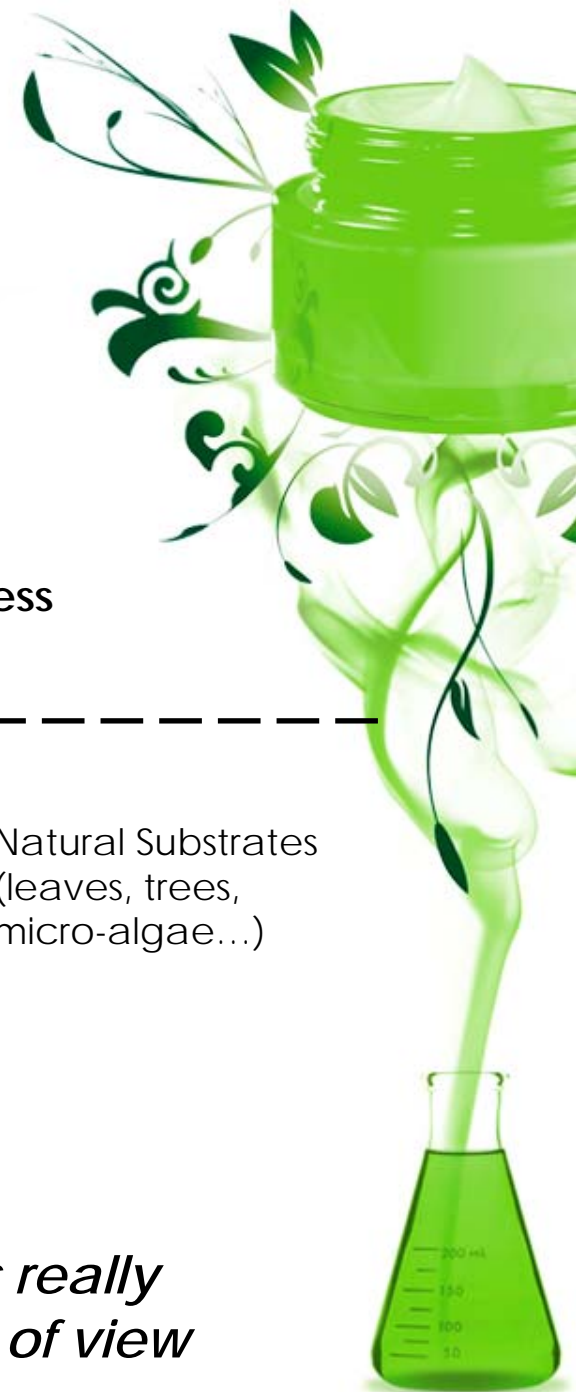
- ❑ Chemical modifications of polysaccharides
- ❑ New green Building Blocks and their polymerisation
- ❑ Green process : Reactive Extrusion, plant extracts, limitation of the use of solvents
- ❑ Efficient catalytic process : Enzymatic synthesis



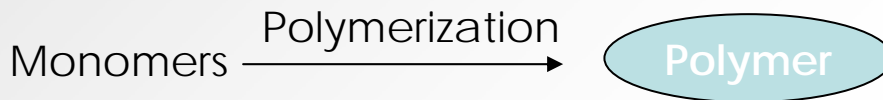


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## Biobased Polymers at l'Oréal

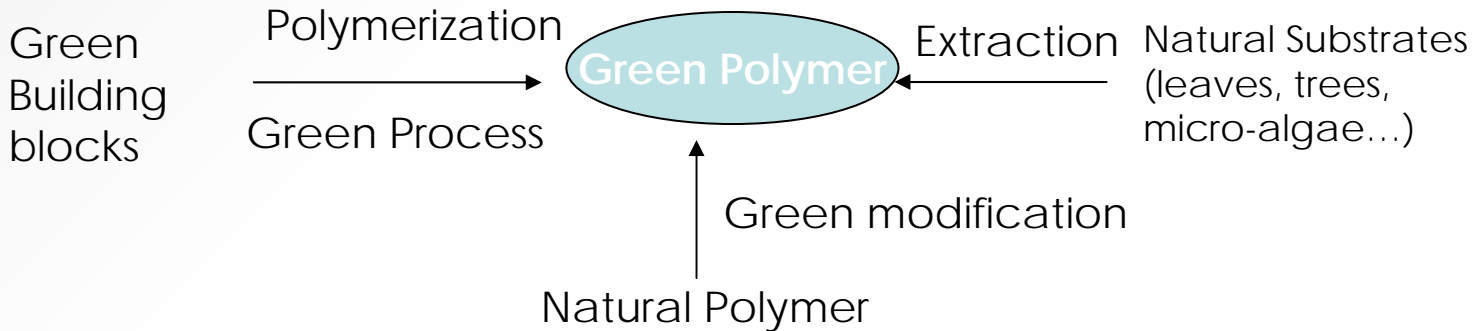


Synthetic



Broad diversity of monomers & Process

Natural



*Very few commercial building blocks really acceptable from sustainable dvt point of view*







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## CONCLUSION

### Main interests

Safe and Eco-safe Water-based Polymers  
Polymers from Renewable Ressources  
Composite Materials  
Green eco-friendly surfactants  
Green Solvents and cosmetic oils

### Research Programs

Chemical modifications of polysaccharides  
New green Building Blocks and their polymerisation  
Green process  
Efficient catalytic process

