Training school

Business Development for Active and Intelligent Packaging

Introduction

24th of September 2018

Grenoble, France

Julien BRAS

Univ. Grenoble Alpes, Grenoble INP - LGP2 (UMR CNRS 5518)

Institut Universitaire de France (IUF 2016-2021)

OUTLINE

- ❑ Welcome in Grenoble (INP (LGP2))
- ❑ ActInPak introduction
- ❑ Training school program

Welcome / Bienvenue

www. pagora.grenoble-inp.fr

1 building / 2 structures

Univ. Grenoble Alpes

Communauté UNIVERSITÉ Grenoble Alpes

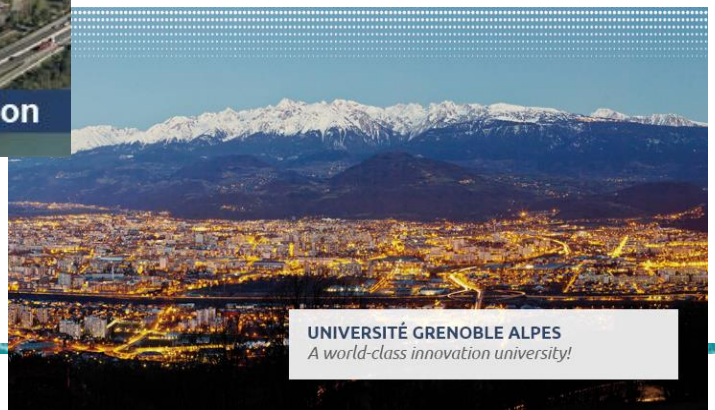
- **62 000 students**
- **3 700 PhD students**
- **7 000 staff members and researchers**

→

- **3,700** PhD students
- **45%** from abroad
- **9 national organisms** (CEA, CNRS, CEN/Météo-France, CRSSA, Inserm INRA, Inria, IRD, Irstea)
- **5 large international research facilities** (ESRF, ILL, EMBL, IRAM, GHMFL)
- About 70 Laboratories

6 research departments :

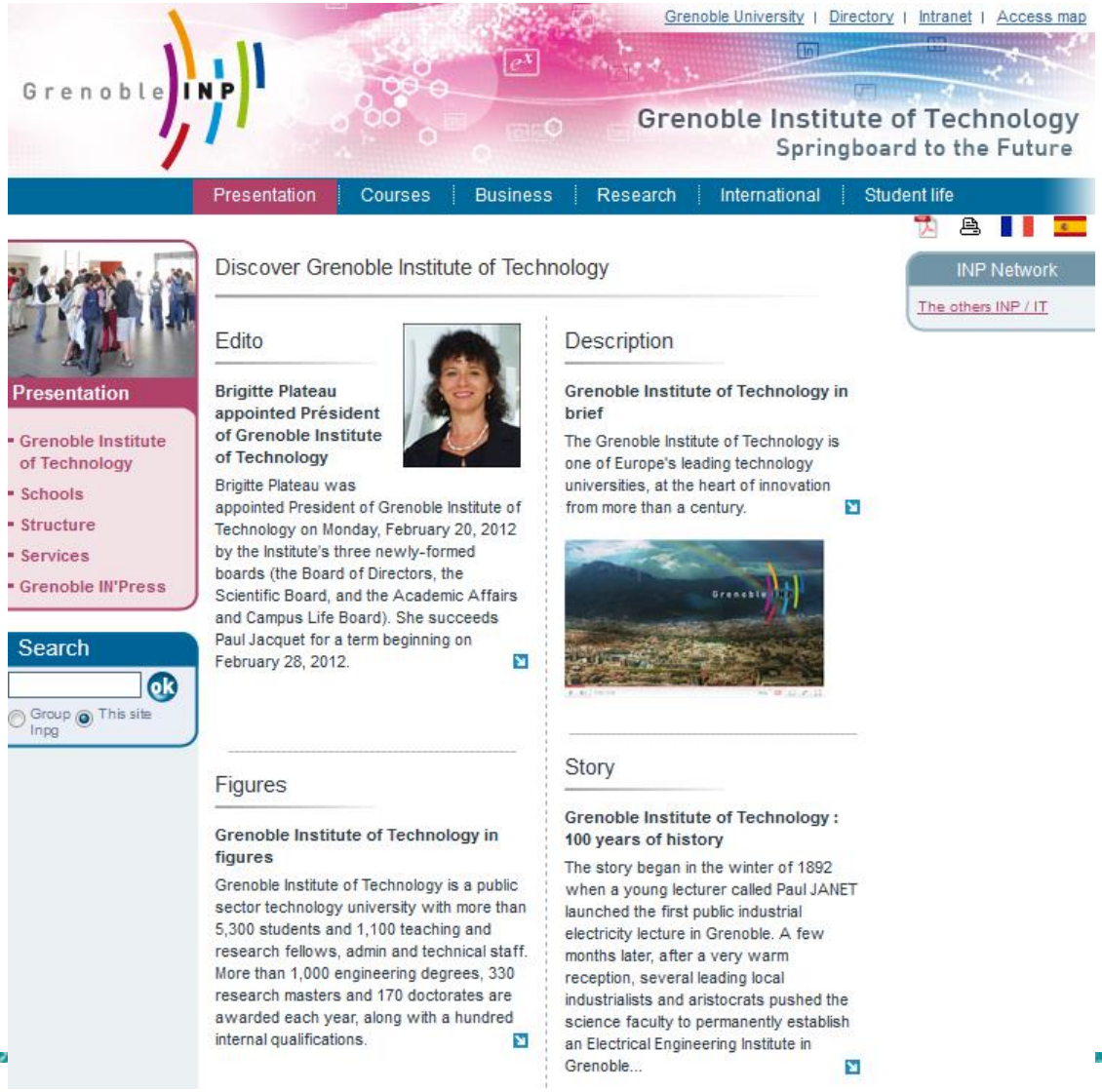
- Mathematics, Sciences and Technologies of Information and Communication
- Chemistry, Biology, Health
- Physics of Particles, Astrophysics, Geosciences, Environment and Ecology
- **Physics, Engineering, Materials**
- Legal, Political and Economic Sciences, Territory Sciences, Sociology and Management
- Arts, Literature, Languages, Humanities, Cognitive and Social Sciences



Grenoble INP

Grenoble Institute of Technology :

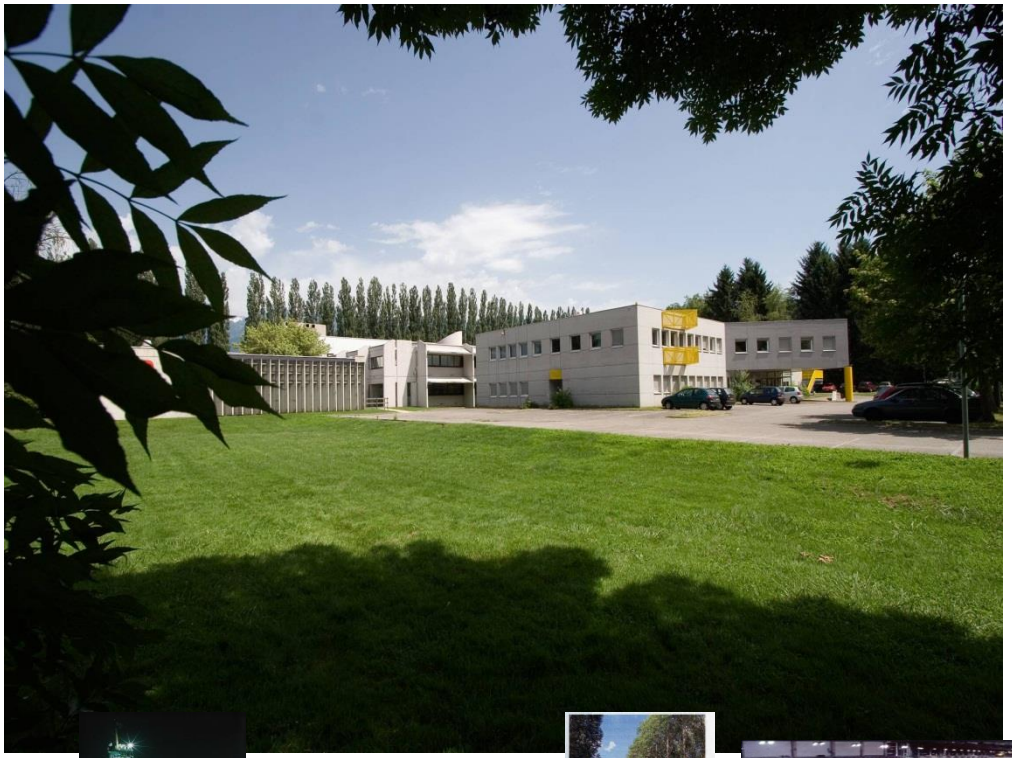
- More than 5,300 students selected
- 1,100 teaching and research fellows, admin and technical staff.
- Every year: 1,000 engineering degrees, 330 research masters and 170 doctorates
- international partnership with research and higher education establishments in more than 53 countries
- 38 research laboratories,
- Strong links with industry



Grenoble INP PAGORA:

International Engineering School of Paper, Printed Communication & Biomaterials

- Created in 1907 by Industries (EFPG)
- High level Engineer school
- Only 1 in France / Top 3 in Europe
- 250 students



Site : http://pagora.grenoble-inp.fr/
Facbook + linkedIn

Grenoble INP PAGORA

Selection concourse after specific preparatory cycle (2 years)
– High level students only

Equiv. Europ. Level

Year 1

Engineer sciences

L3

Operator training: 1 month

Year 2

Fibre & Biomaterials Engineering

Printing Communication engineering

M1

Technician training: 2- 3 months

Year 3

Product, Industry, Project

Sustainability Engineering process

Others: international, Join Diploma

Engineer assistant/ Master thesis
Training : 5 months

M2

AT THE CROSSROAD OF LEADING DISCIPLINES
CHEMISTRY, MATERIALS, PROCESSES

tec21
the engineering of complexity

Glyco@Alps
Univ. Grenoble Alpes

INSTITUT CARNOT PolyNat

Key figures

- ✓ **23 tenured professors and researchers**
- ✓ **10 FTE support staff (technical and administrative)**
- ✓ **40 PhD students and post-doctoral fellows**

85 persons (65 FTE)

50 trainees & visiting researchers

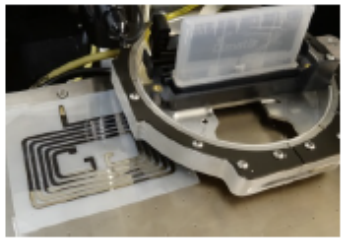
60 publications & 40 International Conferences

Budget: 3.540 Million Euros

- 1.6 M€ permanent staff
- 0.890 M€ operating and investment budget
- 1.0 M€ non permanent staff
- 0.050 M€ state operating grants

Organization : 3 research groups

3 Research Groups



BioChip
Biorefinery: chemistry and eco-processes
Dr C. Chirat

MatBio
Multi-scale bio-based materials
Dr J. Bras

FunPrint
Surface functionalization by printing processes
Dr D. Beneventi

- ✓ Cellulose, hemicelluloses and lignin: biorefinery and bioproducts
- ✓ Caractérisations of the lignocellulosic biomass constituents

- ✓ Building blocks from vegetal biomass
- ✓ Manufacturing processes for plastics, composites and fibre-based materials (papers, cardboards, nonwovens…)

- ✓ Formulation, characterization of complex fluids and inks
- ✓ Printing processes for functional components and systems
- ✓ Additive manufacturing technology

Laboratory of Paper science & Graphic arts
LGP2 - UMR 5518

1/3 of **Fundamental** Research

(Univ collab, Own project, IUF)

1/3 of **Collaborative** Projects

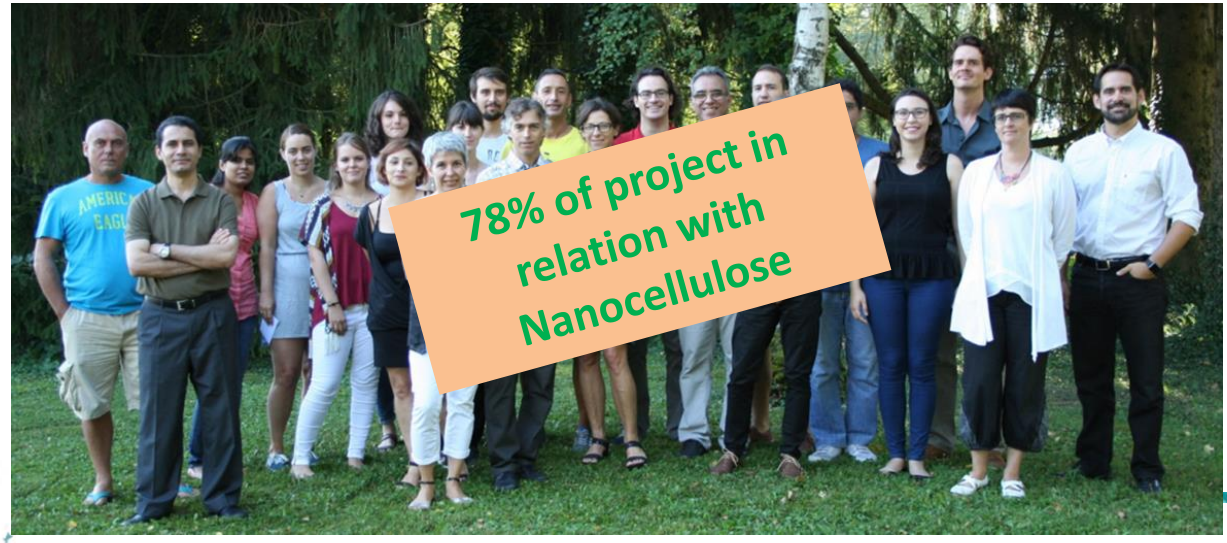
(> 5 partners, ANR, FUI, H2020, Cost)

1/3 of **BtoB Projects**

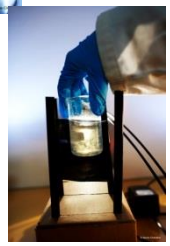
(company, confidentiality, patent, pilote –machine trials)

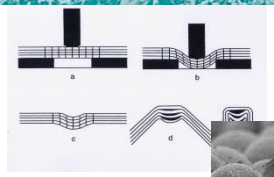
Pierre Fabre · Tetra Pak · Banque de France Eurosystème · Ahlstrom Munksjö · Medtronic (When Life Depends on Medical Technology) · delfort · PepsiCo · Bolloré Thin Papers · tembec · Solvay · Nestlé · Owens Corning

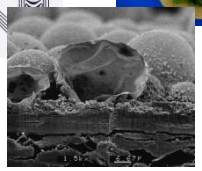
20-30% foreign collab.
40% co-signed scientif. paper

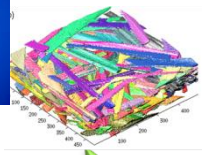


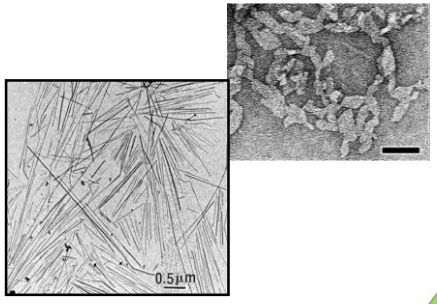
Multi-scale Biobased Materials Dpt







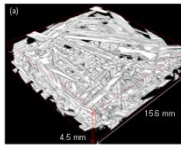


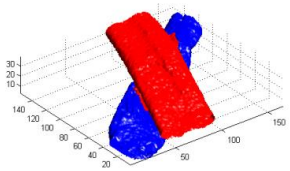


T1= Building blocks

T2= suspension& blends

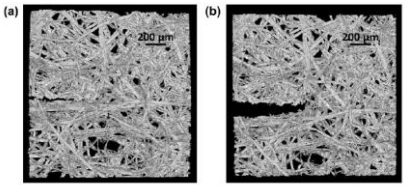
T3= Composites & Fibre based materials

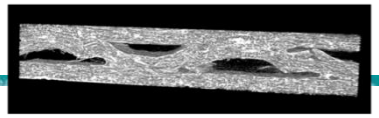


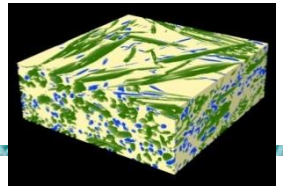


Matbio Team

	Discipline	Approach	Application
T1- Building Block	Chemistry	Experimental, (theorie)	(Nano)composite, Paper, packaging, agro-industrie
T2- Suspension & Blend	Process	Experimental, modeling,	Paper, Composite, (Cosmetic, medical, paints)
T3- Composite & fibre-based materials	Materials	Experimental, modeling	Paper, Packaging, Medical Biocomposite (Building, Energy)







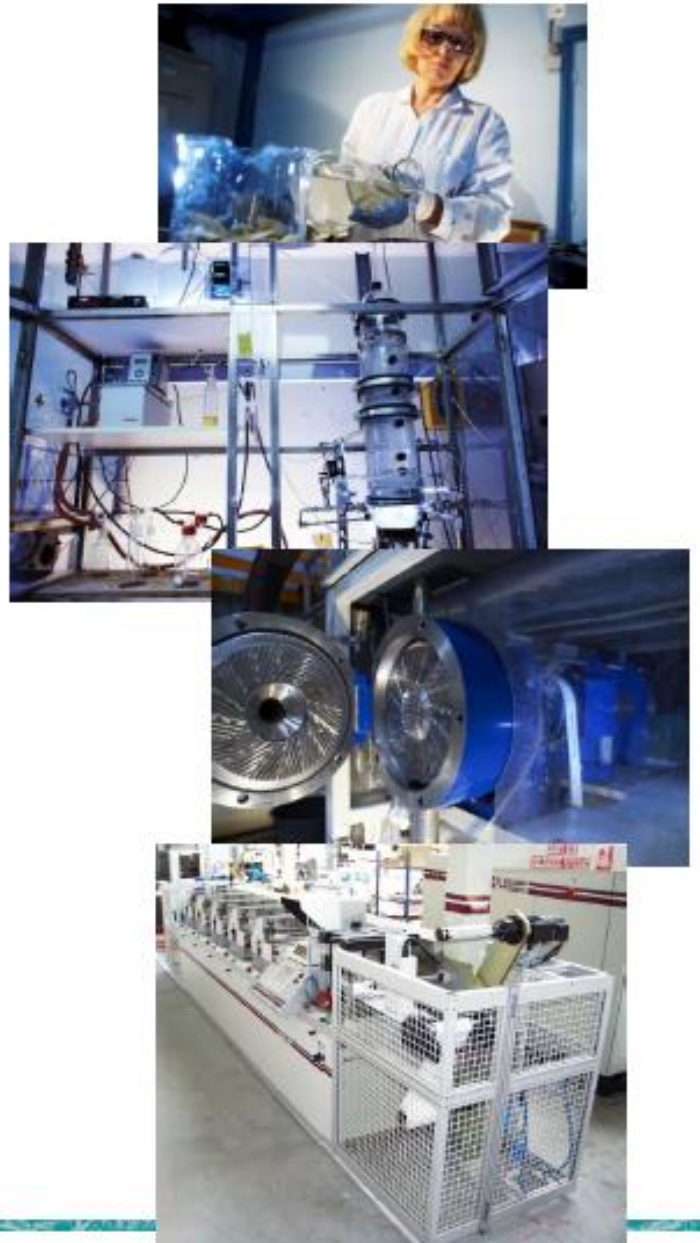
PROCESS platform

✓ **Conversion of plant biomass:** delignification and bleaching reactors, pilots for the production of NCC/NFC/MFC, ASE reactor …

✓ **Manufacturing processes for paper, board and composites:** pilots and laboratory facilities (refining pilot with instrumentation, flottation cells, pilots for membrane filtration)

✓ **Printing processes and surface functionalisation**

- Pilots: flexographic, digital and screen printing presses,
- laboratory equipment: inkjet, rotogravure printing,
- surface treatment: coating, Corona



Collaborations

Academic partnerships:

LEPMI, TIMC, DCM
AgroParisTech (Genial), LPTM (Mulhouse), SRSMC (Nancy)
Politecnico de Turin, Université de Marakkech, Université de Sfax (Tunisie), Universidade federal de Sao Carlos (Brésil), Universidad Nacional de San Martin (Argentine), Université de Menofia (Egypte), Université de Monastir (Tunisie), Scion (New Zealand) ...

Industrial partnerships:

Azur Adhesifs, Robert Blondel, Papeterie Gerex, Arkema France, Rhodia Operation, Ahlstrom, Siliflow, Paxitech Sas, Schneider Electric, Papeterie Du Leman, Neopost Technologies, Arjo Wiggins, Da Research Center Co, Sappi, Kemira, Xylem Groupe Wedeco, Ozonia, Lafarge, Mpo Energy, Solvay, Screen Solar, Gerflor, Kadan, CEA, Ifpen, Fondation Tuck, Tetra Pak, Cargill, Polypore, Poly-Ink, Bluestar Silicone, Chesapeak, Imerys, Upm-Kymmene, Stora, Emin Leydier, Saint Gobain, Creathes, Sca, Les Papiers De Presse, La Manufacture Des Deux Ponts, Imprimerie IPS, Allimand, PSB Industries, Europac...

OUTLINE

- ❑ Welcome in Grenoble (INP (LGP2))
- ❑ ActInPak introduction
- ❑ Training school program

Participants

>200 participants from 34 EU and 7 international partner countries

Core Group

Chair
Sanne Tiekstra, NL

Vice-Chair:
Julien Bras, FR

STSM Coordinator
Marco Giacinti B., IT

WG1
Selcuk Yildirim, CH

WG2
Johanna Lahti, FI

WG3
Greg Ganczewski, PL

WG4
David Ravnjak &
Tadeja Muck, SI

KTC/IIC
Johannes Bergmair &
Victoria Heinrich, AT

Editorial Board
Diana Gregor-Svetec, SI

Active and intelligent?

Active packaging influences internal environment of packaging to proactively improve the quality of the packaged good

Intelligent packaging senses changes and communicates that to the consumer

…as > 20 years of R&D…

TOXDTECT

FRESHFILM

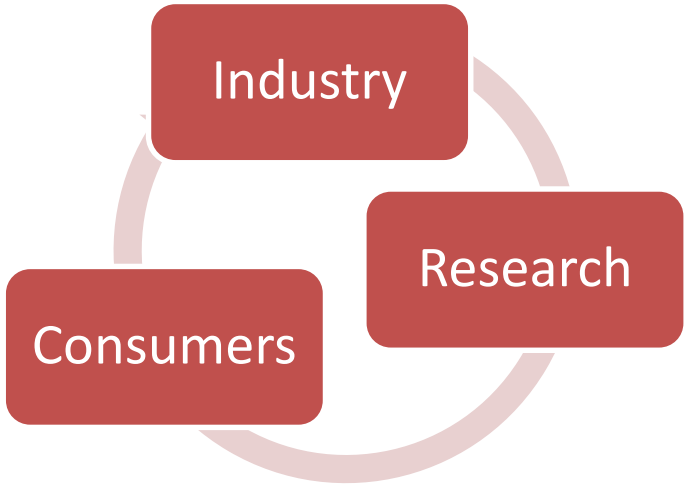
Why this Action?

1. Most developments are plastic based. Development of integration into paper based products. How?

2. So many examples, but so little evidence of succesful (B2C) market introduction in Europe.
   Why?

Our activities

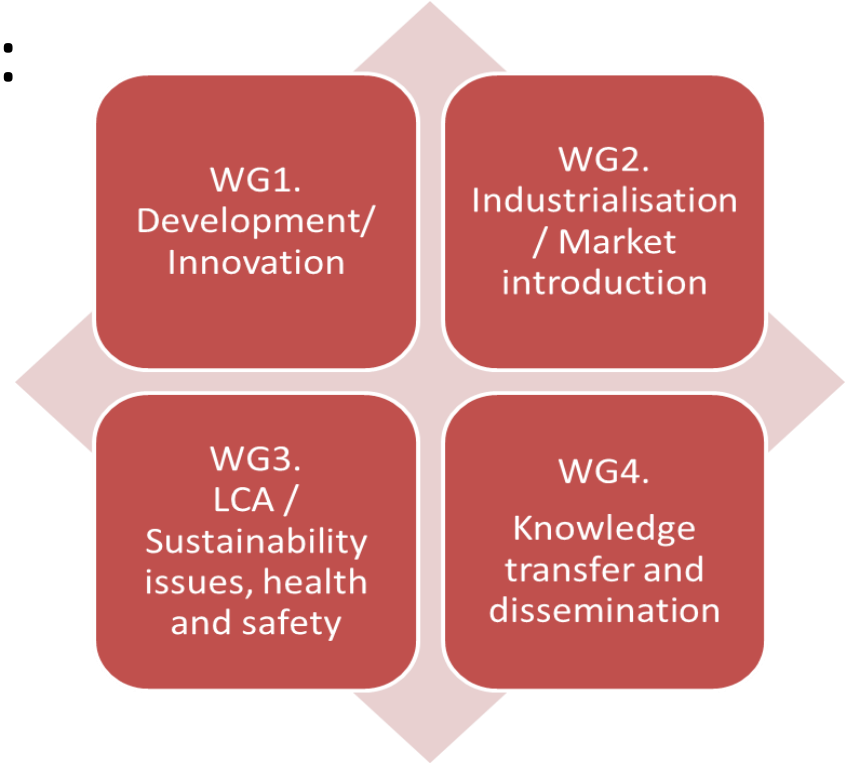
The main objective of the Action is to develop a **knowledge-based network** on sustainable, active and intelligent fibre-based packaging in order to **overcome current technological, industrial, and social limitations** that hinder the wide deployment of existing and newly developed solutions in market applications.



Successful industrial incorporation

depends on several factors:

- Social
- Technology
- Economics
- Ecology
- Politics/Legislation



Industry versus science

Active involvement **of complete value chain**

- Currently: 47 companies from 16 different countries, ranging from large to small

OUTLINE

- Welcome in Grenoble (INP (LGP2))
- ActInPak introduction
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Training school Program

Business Development for Active and Intelligent Packaging ?

DAY1 – From engineering to Market understanding and society expectation

	Time	Event	Location
Monday, September 24th, 2018	10.00 -10.30	Welcome	Grenoble INP Pagora Room D2
	10.30 – 11.00	**Training School introduction** – Julien Bras	
	11.00 – 12.30	**Innovation Mgt for dummies** – Karine Samuel, Grenoble INP	
	12.30 – 14.00	Lunch – by your own	
	14.00 – 17.00	**International - intercultural approach in our society and in packaging market** Sophie Belanger, Grenoble INP et Sabine Sainte-Rose, Univ. Grenoble Alpes	
	Evening	Dinner – by your own	

Training school Program

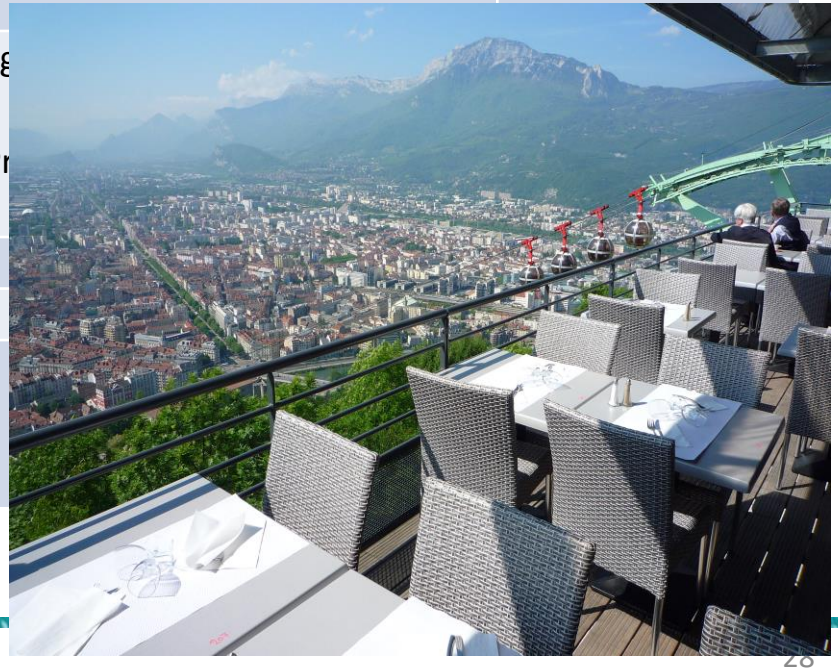
DAY 2 - How to design new packaging and to scale up its production?: from idea to business model

	Time	Event	Location
Tuesday, September 25rd , 2018	9.00 – 10.15	- Creativity and idea evaluation – Julien Bras, Grenoble INP - Designer discussion: from idea to demonstrators /round table – Eric Romeo, Sistemi Moderni	Grenoble INP Pagora
	10.30 – 12.30	- Moving from an idea to the production : Anouk Dantuma, Schut Papier (Neth.) (1h) - Eco conception & sustainability, Agnes Boyer, Grenoble INP (30min) -What is a business model, Karine Samuel, Grenoble INP (20-30min)	Room D2
	12.30 – 14.00	Lunch – by your own	Room B116
	13.30 – 17.30	Value proposition of packaging demonstrator or their own project – Group (4pers) (K.Samuel, Pr Grenoble INP, J.Bras, Pr Grenoble INP)	
	18.30	City Tour	
		Dinner – by your own	

Training school Program

DAY 3 - How to fill the gap between science and industry: from business model to business plan?

	Time	Event	Location
Wednesday, September 26rd , 2018	9.00 – 10.30	Intellectual Properties advises – Julien Bras (30min) Technology transfer : an example in France –SATT Linksium – Gisela Schach (1h)	Grenoble INP Pagora
	10.45 – 12.30	How to sell your R&D solution to a company? Nuria Herranz, Itene (1h) How to launch a start-up – Karim Missoum (30min)	Room D2
	12.30 – 13.30	Lunch – by your own	
	13.30 – 18.30	Business plan elaboration of packaging project (Karine Samuel, Pr Grenoble INP, J.Bras, Pr	
	19.30	Gala Dinner - Bastille	



Training school Program

Day 4: Final packaging in industry

	Time	Event	Location
Thursday, September 27rd , 2018	9.00 – 10.00	Pitch preparation	Grenoble INP Pagora
	10.15-12.15	How to do business development in industry (1h) – Laurent Schildknecht, Ahlstrom-Munksjo International R&D: from lab to industry (1h) – David Guerin, CTP	Room D6
	12.30 – 13.30 lunch – by your own		
	13.30-17.00	Pitch of demonstrator / own packaging presentation : panel discussion (feedback from experts and industrials) (Karine Samuel, Pr Grenoble INP, J.Bras, Pr Grenoble INP)	Room B116
	16.30-17.00	End of the training school / visit of LGP2	

Attendees

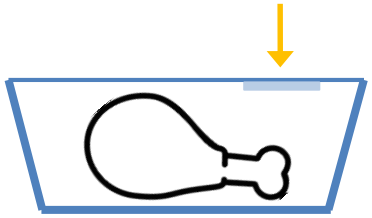
From all other Europe

- 26 attendees
- 14 trainers
- 19 countries

+ Colombia, Mexico, Brasil, India

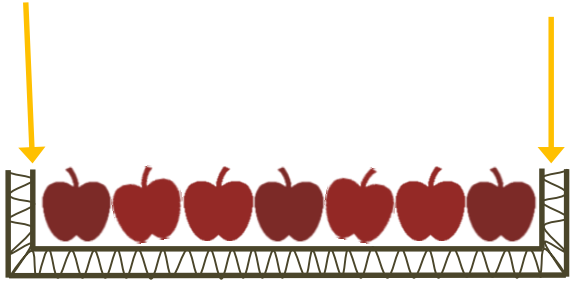
3 demonstrators

Indicator &
Detection of bacteria

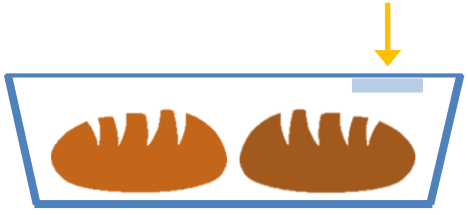


Ethylene
scavenging
inner layer

Antibacterial / anti mould
corrugated layer
sandwiched between
inner and outer layer

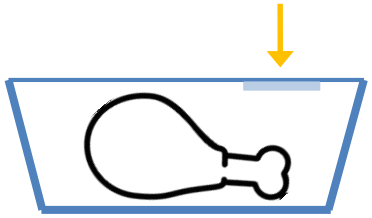


Oxygen scavenger applied as a label
on interior of MAP packaging



3 demonstrators

Indicator &
Detection of bacteria



Team Yellow 1:

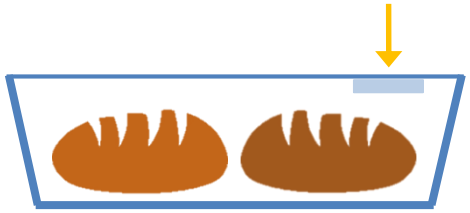
- Iva Sarcevic
- Hugo Spieser
- Tina Zurbi
- Vesta Navikaite-Snipaitiene

Team Red 1:

- Masa Zveglic
- Karolina Almonaityte
- Maria-josé Costa
- Greg Ganczewski

3 demonstrators

Oxygen scavenger applied as a label on interior of MAP packaging



Team Yellow 2:

- Kelly Johanna Figueroa
- Stefan Durdevic
- Emilia Vann Yaroson
- Kopacic Samir
- Anouk Dantuma

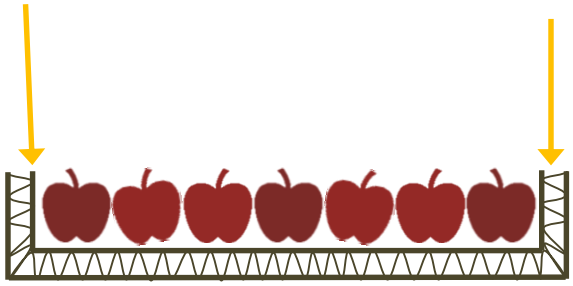
Team Red 2:

- Graziele Grossi
- Adriane Cherpinski
- Urska Kavcic
- Cynthia Fontes

3 demonstrators

Ethylene scavenging inner layer

Antibacterial / anti mould corrugated layer sandwiched between inner and outer layer



Team Yellow 3:

- Esther Rincon Rubio
- Bilge Yilmaz
- Rajesh Koppolu
- Veronika Stampfl
- Orcun Caglar Kurtulus

Team Red 3:

- Eduardo Espinosa Victor
- Ahmet Ozan Basar
- Eloisa Ferone
- Emma Talon Argente
- Velta Fridrihsone

Thank you for your attention

@JulienBras

Julien Bras

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tec21 the engineering

Glyco@Alps Univ. Grenoble Alpes

institut universitaire de France

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