



The Universities of Belgium (Wallonia-Brussels), fully involved in the fight against the Corona disease, and together focused on societal challenges



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**Interview with Dr Ir Michel MORANT
and
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prepared to face an epidemic, specially the more developed countries where the advanced medical systems had induced a total feeling of security among the population.

When the medical systems were overloaded by patients, the governments called scientists for help to understand what was happening, to evaluate what could happen, to give advise to slow down the disease, and to explain to the population what to do and what to avoid.

Never in the past, such a number of academics were called to explain in all media the situation, what measures should be taken, what is the evolution of the COVID in the population, in other countries.

It looked like the daily debriefing of the US General Colin Powell during the first Gulf war, with the difference that soldiers had been replaced by scientists.

Virologists, epidemiologists, physicians, medical doctors, intensive care unit specialists, economists, psychologists, pediatricians, ... all have been asked to give opinion or advice, to describe the reality, the problems.

Of course, this was the visible part of the iceberg, day after day.

What was then the hidden part of the iceberg?

The role of universities is to act permanently at frontier research in order to provide an updated education to the students, whatever their age, and to help the Society answer to fundamental questions. Particularly in the Corona crisis, when a new phenomenon – a totally unknown, but very active virus - appears, a lot of questions rise and wait for answers. What kind of virus? What's its behavior? What could be the consequences? How to efficiently detect it? How to treat it? How to prevent it? How to measure its expansion? How to slow its expansion? What could be its sequels? How to organize the Society to face it? What should be the restrictions for the population? What are the economic consequences? How to organize schools? How to organize retirement homes? How are young people affected? And what about the elderly? ...

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Could you remind us of the missions of the LIEU Network?
The 'Fédération Wallonie-Bruxelles' Universities have a great deal of potential for innovation, which they want to use for the development of the region. This is the aim of KTOs (Knowledge Transfer Offices), also known as interfaces. In 2003, these organisations decided to work together and create the LIEU Network, which is supported by the Walloon Government and the Conference of Rectors.

The LIEU Network has four objectives:

- to promote the scientific resources of universities and facilitate their access to companies;
- to develop research collaborations between companies and research units;
- to operate the tech transfer, from scouting inventions to licensing and spin-off creation;
- to support the teams in a continuous process of professionalisation.

Indeed, since early 2020, our life around the whole world has been re-shaped by the COVID-19 pandemy. What has been the role of universities during this period?

The universities have played a growing role during this period. At the beginning, some alert launchers claimed in the desert that a new problem was rising. Most countries were totally un-

6 sectoral gateways



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All of those questions concern and mobilize experts from all disciplines: medical of course (virology, epidemiology, breath diseases, ...), natural sciences, statistics, geography, demography, engineers, psychology, sociology, computer sciences, ...

The capacity of a country or a community to face the problems was related to the capacity of embedded top scientists to help the governments to take adequate decisions. Of course, while facing such a new situation, the answers can differ, hypothesis are tested, experienced, improved, based on trials and errors processes.

Let us also emphasize the capacity of scientists to exchange on a planetary basis, in an actual and full-scale open science exercise, with the result that the number of ways and the speed to get outcomes have drastically increased.

Can you present some examples?

The genome of the virus was rapidly decoded in order to detect it and DNA protocols have rapidly been set up. But, as soon as the epidemic became pandemic, a worldwide need for specific reagents appeared, with a rapid shortage of most of them.

Testing

UNamur proposed then a list of well-known protocols for producing reagents in university labs, and this diagnostic method was widely disseminated in other universities among 28 countries. Testing platforms have been quickly set up in all universities and university hospitals, with many volunteers among researchers and technicians to face the peak of demand.

ULiège focused its efforts first to develop a kit of diagnostic to increase the testing capacity in Belgium by using automated machines instead of manual protocols. New fabrication protocols for specific reagents were developed by the chemical department, while a cooperation with companies enabled a local production of all necessary plastic consumables to be used on the automated machines. With 400.000 tests realized over 6 months, the Liege testing center is the largest center in Belgium and provides reagents and materials to other testing centers in Belgium and abroad. The next step which was available in September was developed to enable mass testing of the population. The test is based on a saliva sample that is put directly by the patient in a tube, without the help of any medical professional. The virus is automatically inactivated in the tube and the sample is sent to



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the laboratory in a PCR protocol, and the patient can directly be informed of the results. The first mass testing application has been applied weekly to the university community of 30.000 students and employees.

"Spin-off companies, created on the basis of university research like Zentech, e-Biom..., in collaboration with Diagenode, Coris Bioconcept, which work closely with universities, have also developed PCR kits, serology kits, kits for wastewater flows, ..."

Devices

In intensive care centers, breath assistance was required for many patients, and Engineering schools of ULB and UCLouvain provided home made artificial respirators. Some companies, in cooperation with labs (UMONS, ULiège, UCLouvain, ...), have developed specific UV lamps or plasma lamps to kill the virus or radiations protocols for the sterilization of masks. Our Fablabs have developed the production of swabs or protection glasses or screens.

In the emergency services, 40 to 50 medical masks are currently used per day and per patient. In view of the current shortage of healthcare staff, it is essential to study the possibility of decontaminating this equipment in order to reuse it. In recent years, plasma technologies, developed in symbiosis at Mons by UMONS and Materia Nova, have often been highlighted for their ability to modify and improve the surface properties of



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materials of all types. In the context of the current health crisis and the glaring problem of a shortage of medical equipment, a working group was set up to study ways of producing masks and reusing used ones. In the UMONS and Materia Nova laboratories, in collaboration with the Centexbel research centre and with the ULiège and Liège University Hospital, it was demonstrated that plasma cleaning of surgical masks is a promising approach which, in relatively short treatment times (< 15 minutes) and using inexpensive equipment, makes it possible to reduce viral contamination by 4 orders of magnitude and bacterial contamination by 6 orders of magnitude, without affecting the filtering properties or breathability of the masks.

Symptoms

Physicians of UMONS have led a wide study on the disturbances of taste and smell (anosmia) that is experienced by COVID patients, and also on the recovery process.

This study showed that :

- mild forms of COVID-19 infection present a different set of symptoms from severe forms. Anosmia is a specific symptom of mild forms;
- currently, patients with initial or isolated severe anosmia appear to have a 90% risk of suffering from COVID-19.

Epidemiology

UCLouvain has been involved in the field of epidemiology studies in Belgium and in Italy to better understand the dissemination of the virus.

Vaccines

UCLouvain and ULB are quite active in immunology and vaccine development. ULB and UAntwerpen together have set up a specific testing center for vaccines with 30 beds, with the aim of rapidly testing any vaccine on patients when it will be available according to the classical safety rules of course.

Human and social consequences

Humanities are also very important to help us understand the behaviour, the resistance, and the resilience of people or communities in confined situations. UCLouvain has led different studies on how parents, families and kids can bear a long confinement period, and how the mental health of the population changes during the confinement. Of course, economists have also developed new models to assess the impact of the pandemic on companies, the society, and welfare.



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Researchers from the University of Mons (UMONS) have pooled their expertise to create a website dedicated to the detection and understanding of anxiety among the youngest among us (from 3 to 25 years old) in this period of epidemic and lock-down. These examples aim at illustrating the involvement of all disciplines in universities to bring an added value to the fight against the coronavirus and the COVID-19 disease. This huge mobilization happened within some weeks and is a testimonial of the engagement of universities in the third mission towards the Society.

Aside from the role of Universities in the fight against COVID-19, could you tell us more about LiEU's organization, actions and roles? Who are the members of the LiEU Network?

The LiEU Network brings together the KTOs of Belgian French-speaking Universities:

- Université catholique de Louvain – UCLouvain;
- Université libre de Bruxelles – ULB;
- University of Liège - ULiège;
- University of Namur – UNamur;
- University of Mons – UMONS;
- Université Saint-Louis – Bruxelles.

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Knowledge Transfer Offices



UCLouvain



ULB



LIÈGE université



UMONS
Université de Mons



UNIVERSITÉ DE NAMUR



UNIVERSITÉ SAINTELOUIS BRUXELLES

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The LiEU Network works closely with other players for innovation such as SOWALFIN, SynHERA, Enterprise Europe Network, ...

What partnerships have you developed?

The LiEU Network and academia have a good record of collaboration with the 6 Walloon competitiveness clusters (BioWin, Wagrallim, Skywin, Greenwin, MecaTech, Logistics in Wallonia) and works at different levels. When calls for tenders are being launched by the Walloon Government through the clusters, each thematic working group helps the clusters to identify university teams that may be interested.

The LiEU Network also assists them in drawing up projects submitted for public funding and helps them map out regional university research potential. The LiEU Network also helps promoting the results generated by cluster projects and is typically involved in brokerage events organised by the clusters, such as the BioWin Days.

It is important that the LiEU Network and the clusters coordinate their efforts to achieve optimal effectiveness.

Could you introduce the 6 working groups organised by professional sectors of the LiEU Network?

We quickly realised the benefit of organising ourselves into thematic working groups that bring together the scientific advisers



from the various institutions according to their field. The LIEU Network brings together the skills of more than 10,000 researchers in the following areas: agro-food, biotechnology and health, energy and environment, materials, digital technologies, human and social sciences.

These thematic working groups are actual technology platforms, operational gateways to the labs for companies seeking access to university expertise: they analyse the requests from industry, direct them to the academic teams who are in the best position to handle the technical challenge and assist them in setting up collaborations. These platforms are also platforms to promote new results, new technologies which are available for companies.

Of course, these platforms work in close collaboration with relevant partners, especially the 6 Walloon competitiveness clusters, the 23 industry research centers or sectorial federations in such varied fields as chemistry, electronics, agribusiness, etc.

What are your technology offers?

The technology offers showcase innovative technologies whose intellectual property has been secured thanks to the support of the scientific advisers and the patent experts of Knowledge Transfer Offices. These technologies are available for valorisation and commercialisation. This can take different forms: a license agreement or research collaboration with a private company.

Could you tell us about your services to the 10,000 researchers of the 'Fédération Wallonie-Bruxelles'?

A researcher's primary job is to carry out research, with all this entails in terms of scientific publishing and excellence. With this in mind, it is the responsibility of the LIEU Network and KTOs to mobilise researchers and support their efforts into the innovation

process and also to contribute to the regional development. This mobilisation ranges from awareness-raising actions and intellectual property, to research contracts and funding, even though researchers are much more familiar with this than they were 15 years ago.

Responsibility of LIEU members is to help researchers to bring projects from TRL (Technology Readiness Level) 2 to TRL 4 or even TRL 5 to 6. This includes managing IP (Intellectual Property), achieving the proof of concept, looking for relevant partners, setting up agreements, and finally transferring properly the technology to the more suitable partner to get to the market. Additionally, the LIEU Network brings some support for the promotion of laboratories among companies, using industrial language and standards, instead of pure scientific approach.

How do you assist companies?

Our first area is providing access to university expertise that can meet the needs of companies. This is a considerable task as the knowledge and technologies available are highly diverse. Our second area is the organisation of meetings to match offer and demand.

Finally, our third area is assisting in implementing research collaborations and technology transfers. It is essential that these fundamentally different environments of research and business understand each other and work together in the interest of both sides and regional development.

What are the salient features of your 2019 activity report?

In 2019, the LIEU Network raised the awareness of about 3.500 researchers to calls for projects, intellectual property and valorisation. It also supported 100 patent applications and conducted more than 1.200 contacts between companies and researchers at meetings that were organised with KTOs.

In addition, the LIEU Network takes care of 200 invention disclosures and about 1.000 new applied research contracts each year (research agreements, service agreements and others). The KTOs of LIEU also provided 175 technology transfers in 2019 and created 10 spin-off companies.

Let us recall that since its creation, the LIEU Network has supported the creation of more than 300 spin-offs, employing more than 5,000 people.

Find out more about us here: <https://www.reseaulieu.be/>

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	171 technology transfers
	3434 researchers sensitized to knowledge transfer
	195 Invention disclosures
	99 patents granted

10 spin-off companies created			