

## A BRIEF HISTORY OF BELGIAN IMMUNOLOGY AND ITS SOCIETY

*The Belgian Immunology Society was founded in 1978 but research in Immunology as a separate scientific medicine was already performed in the first half of the 20<sup>th</sup> century, with a.o. the pioneering role of Jules Bordet. Later, Joseph Heremans, active member of the European Society of Immunology, would give the impetus to the creation of the Belgian Society, creation he would not live to see because of his unfortunate and sudden death in 1975.*

Belgium has a long-standing history in Immunology. In 1919, **Jules Bordet** (1870–1961; Fig. 1) received the Nobel Prize in Physiology or Medicine for his ‘discoveries relating to immunity’. After a stay in Metchnikoffs’ lab in the Pasteur Institute of Paris (1895–1899), Bordet returned to Belgium and in 1901 he was appointed by the Province of Brabant as first director of the *Institut Antirabique et Bactériologique*, later called the Pasteur Institute of Brabant [1]. Bordet discovered the interaction of complement, called ‘alexine’, with the antigen-antibody complex. This so-called fixation of complement was later adapted by the German von Wasserman for the detection of syphilis. Together with his brother-in-law Octave Gengou, Bordet also succeeded in 1906 in cultivating the bacterium *Bordetella pertussis*, from a clinical isolate of his two-month-old son Paul, suffering from whooping cough. Eventually, the duo even prepared a heat-killed *Bordetella* vaccine that was used for a short while in Belgium and the North of France.

Another famous Belgian immunologist was **Joseph F. Heremans** (1927–1975). In

1959 he discovered IgA in humoral secretions and coined the name ‘immunoglobulins’. Together with Giuliana Mancini (his future wife) and Carbonara, Heremans developed in 1965 the radial immunodiffusion assay for the immunochemical quantification of antigens [2]. 1974 he was a co-founder of the Louvain Institute of Cellular Pathology (ICP) together with Nobel Prize awardee Christian de Duve. Heremans was a regular guest speaker and board member of the annual colloquium ‘Protides of the biological fluids’ in Brugge, Belgium. As such he was allegedly involved in the creation of the International Union of Immunology Societies (IUIS), on May 5<sup>th</sup> 1969 in Brugge at the occasion of the 17<sup>th</sup> meeting of *Protides of the Biological Fluids*. He was also an active member of the Editorial Board of the *European Journal of Immunology EJI* since its founding in 1970. His sudden death in October 1975 was a great shock to his Belgian fellow immunologists. In his honor, the Université Catholique de Louvain in Woluwé organizes biannual Heremans lectures (<https://www.deduveinstitute.be/heremans-lectures>).

### The launch of the Belgian Immunology Society in 1978 - The eight founding members

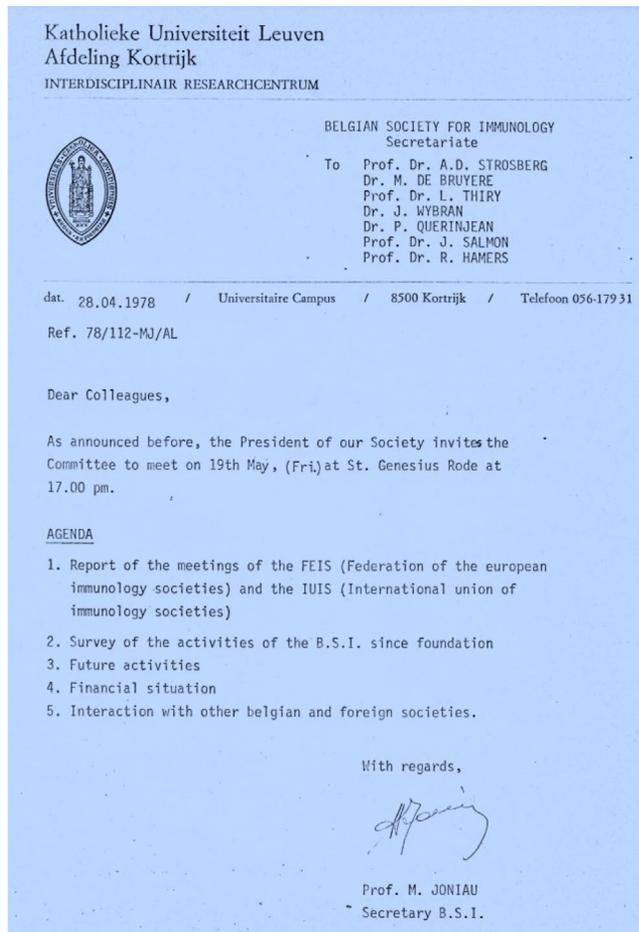
In Belgium, it would take some more years before the *Société Belge d’Immunologie - Belgische Vereniging voor Immunologie* (SBI-BVI) (in English the *Belgian Immunological Society BIS*) was created on February 4<sup>th</sup> 1978 by academics from Flanders, Brussels and Wallonia (Fig. 2). Its aim was to bring together researchers interested in both the clinical and the fundamental aspects of Immunology and promote the development of Immunology as a separate scientific discipline.

The first President of the BIS was **A. Donny Strosberg** (1945–2012) head of the service of Pathological Biochemistry on the *Campus of Molecular Biology* in Sint-Genesius-Rode. The Rode campus, on the outskirts of Brussels, was then shared by researchers from the Université Libre de Bruxelles (ULB) and the Vrije Universiteit Brussel (VUB, split from ULB in 1970) and was a hotspot for the new field of Molecular Biology. Another founding



**Figure 1.** Jules Bordet illustrations in (A) Swedish Stamp and (B). Paul Delvaux, *Portrait de Jules Bordet*, 1952, © Foundation Paul Delvaux, St. Idesbald, Belgium / SABAM Belgium 2022.

**Correspondence:** Kris Huygen  
e-mail: [huygenkris@gmail.com](mailto:huygenkris@gmail.com)



**Figure 2.** Invitation to the first BIS Board meeting on May 15<sup>th</sup> 1978 by secretary Marcel Joniau to all BIS board members.

member was **Raymond Hamers** (1932–2021), VUB professor in immunology on the same Rode campus. From 1974 to 1980 he served as a member of the IUIS Committee on Education. Together with his wife Cécile Casterman and with Serge Muyldermans, he described in 1993 the existence of a new type of antibodies, devoid of light chains, in the blood of camelids. This later led to the development of nanobodies, consisting of single monomeric variable heavy chain antibody domains (tenfold smaller than classical antibodies) [3]. In 2001, the Flemish Biotech Company Ablynx acquired the IP rights and in 2018 Sanofi bought Ablynx for 3.9 billion euro. In 2013 Hamers also created the VUB chair *History and Philosophy of Sciences*. **Marcel Joniau** (°1938) served as the first secretary of the BIS. His affiliation was at KULAK, *Katholieke Universiteit Leuven*, 8500 Campus Kortrijk, as professor in Biochemistry at the Medical Faculty. He also taught immunochemistry

at UIA in Antwerp (1973–1985). Joniau was the rector of KULAK from 1996 to 2001. In a letter of June 1977 to Dr. Francis Loor at the *Basel Institute for Immunology*, he mentioned the plans to create a Belgian Society. **Joseph Wybran** (1940–1989) worked in 1978 at the Blood Transfusion Centre Albert Hustin (*Hôpital Saint-Pierre*) in Brussels. Between 1982 and 1983 he was the second president of the BIS. In 1983, Wybran was elected IUIS, EFIS and Clinical Immunology Committee board member. He later became Head of the Department of Immuno-Hematology at *Erasmus Hospital*, ULB and in 1988 also president of the Coordinating Committee of Jewish Organizations in Belgium. He was killed on October 3<sup>rd</sup> 1989 on the parking of *Hôpital Erasme*. **Marc de Bruyère** (1939) at UCL served as the first treasurer of the BIS. During the 80s and 90s he was responsible for immuno-hematology and transfusion at the *Cliniques Universitaires Saint-Luc*. In addition

he helped many physicians and scientists for problems around autoimmunity, HLA, allergy and others. Another founding member was **P. Querinjean** head of the Laboratory of Embryology in Louvain-la-Neuve. He had collaborated with J F Heremans and later performed research in the Fisheries by Immunological Methods. Seventh founding member was **Jacques Salmon** (1930–2019) of the *Université de Liège*, *Sart Tilman*, who created the service of immunohematology in Liège. He invested himself for more than 30 years in helping persons suffering from alcoholism. The only woman among the founding members of BIS was **Lise Thiry** (°1921). She was since 1952 head of the laboratories of Virology of the *Institut Pasteur du Brabant*. In 1975 she was also appointed *chargée de cours en Virologie* at ULB. Her research later focused on retroviruses and in 1985 her Virology Lab was recognized as one of the eight national AIDS reference centers. In 1985 she was elected ‘Woman of the Year’ and in 2007 a stamp was created featuring her with a picture of the AIDS virus.

The first official address of the BIS was the *Pasteur Instituut van Brabant/Institut Pasteur du Brabant*. The initial building of the Institute, a sort of ‘château’ in the Parc Leopold, had been modelled (on a small scale) after the *Institut Pasteur de Paris*, when Bordet became its first director. The portrait of Bordet painted by Paul Delvaux in 1950 actually shows Bordet at his workbench there (Fig. 1). After the Institute moved to its new locations in Uccle-Ukkel, the historical building of the *Institut Antirabique et Bacteriologique* was bought by the *Société Espace Léopold* and renovated in 2001–2002. It now houses the diplomatic representation of the Land of Bavaria to the European Institutions (<https://monument.heritage.brussels/fr/buildings/36940>). In 2006 the SBI-BVI changed its address to 1180 Ukkel/Uccle, the new location of the *Pasteur Institute of Brussels*, and the Society officially changed its name to Belgian Immunological Society BIS.

### From 1978 to 1989

The interest of immunologists in the seventies was largely devoted to the study of the structure and diversity of immunoglobulins, whereas in the eighties the focus shifted to cellular immunity. It became the epoch of further discovery of interferon(s) and cytokines.

As already mentioned, the ULB-VUB campus in Rode was a hotspot for molecular biology in Belgium. Between 1982 and 1985 **Jacques Urbain** (1943–2018) joined the executive board of the BIS. He obtained his PhD in Molecular Biology at the ULB in 1970 and soon created his own independent research group in 1975. Taking advantage of the expertise developed by his mentor and predecessor, **Raymond Jeener** (1904–1995) in the field of virology [4], he undertook a detailed analysis of the serological immune response of animals inoculated with the Tobacco Mosaic Virus, paving the way for the study of immune repertoires, tolerance and the manipulation of immune responses using antibodies to antibodies, i.e. anti-idiotypic antibodies [5]. He was one of the main supporters of the idiotypic network theory developed by Niels Jerne (1911–1994). Jacques Urbain was granted the Francqui prize in 1987.

The *Rega Institute for Medical Research* had been founded in 1954 by **Pieter De Somer** (1917–1985), who was at that time research director at RIT Genval (the later GlaxoSmithKline) and associate professor at Leuven University. In those years he developed a successful polio vaccine and contributed to the production of penicillin. It was De Somer and his colleagues who had described the action of interferon already in 1961. In 1968 he became the first rector of the independent Flemish Katholieke Universiteit Leuven (KUL). Research at the *Rega Institute* (KUL and RIT Genval) focused on the production and purification of interferon- $\beta$  by Alfons Billiau under De Somers' inspiring guidance. In Belgium, the collaboration between the research group of virologist **Eric Declercq** (1941) at the *Rega Institute* in Leuven, the group of virologist **Jean Content** (1942) at the Pasteur Institute in Brussels and the group of molecular biologist **Walter Fiers** (1931–2019) at Ghent University would lead to the first cloning and expression of recombinant IFN- $\beta$  in 1980 [6].

**Ben van Camp** (1946) MD of the VUB served from 1982 to 1984 first as secretary, later as president of the BIS. Co-founder of the Belgian Hematology Society, he was later rector of the VUB 2000–2008. He was baronized by King Albert II in 2006 for his achievements in the biosciences and the Belgian Academic World. **Etienne Dupont** MD was secretary from 1985 to 1988. He collaborated first with J. Wybran and later with M. Goldman in the department Immunology-Hematology-

Transplantation at *Erasmus Hospital* ULB. He focused his research on cytokine production in transplantation and immunosuppression. **Jacques Van Snick** ( $^{\circ}$ 1951) of the *Ludwig Institute for Cancer Research* in Brussels (UCL), was president of the BIS from 1988 to 1989. In 1986, in collaboration with **Jo Van Damme** in A. Billiau's lab (Rega Institute) he identified T-cell derived B cell growth factor 2, later called IL-6 [7]. In 2000, he was awarded the InBev-Baillet Latour prize (with J.C. Renauld)

### The Presidency of Alfons Billiau (1991–1999)

In 1991 **Alfons Billiau** ( $^{\circ}$ 1937) became the new president of the BIS, function he exerted till 1999. Billiau was professor of microbiology and immunology at the University of Leuven and staff member of the *Rega Institute for Medical Research* of this University. He was also president of the Belgian Society for Microbiology (1996–2009). As already mentioned, Billiau and his colleagues at the *Rega Institute* reported o.a. on the elaboration of a pre-industrial system for production of human fibroblast interferon (IFN- $\beta$ ) and on clinical trials with this interferon [8]. Later his team became involved in the discovery of other cytokines and chemokines produced along with interferon (e.g. IL-6, IL-8 and GCP-2). The last decades of his research career were devoted to the role of interferon-gamma in experimental models of inflammation and autoimmune diseases.

**Michel Goldman** ( $^{\circ}$ 1955) MD served as secretary of the BIS from 1989 to 1995. He is *alumnus* of the Executive Committee of *EJI*. From 1990 to 2008, he headed the Department of Immunology-Hematology-Transfusion at *Erasmus Hospital* (ULB) and from 2004 to 2009 he served as director of the *Institute of Medical Immunology* on the Charleroi Campus of ULB. In 2009, he became the first executive director of the Innovative Medicines Initiative, a joint undertaking of the European Commission and the European Federation of Pharmaceutical Industries and Associations. He is founder of the  $1^{\text{st}}$  Institute for Interdisciplinary Innovation in healthcare.

In 1994 **Pierre-Paul Pastoret** (1946–2015) and his colleagues of the department Immunology-Vaccinology of Liège University reported in *Vaccine* on complete rabies elimination in Belgium by fox vac-

ination using vaccinia-rabies glycoprotein recombinant virus. Also in 1994, **Hervé Bazin** ( $^{\circ}$ 1935) of the faculty of Medicine of UCL (Experimental Immunology) joined the BIS. In 2000, on the occasion of the 20<sup>th</sup> anniversary of the worldwide eradication of smallpox (WHO), Academic Press published his inspiring history of the discovery of vaccinations [9].

**Patrick De Baetselier** ( $^{\circ}$ 1950) BIS secretary (1996–1997), took over the VUB professorship of Immunology from R. Hamers and created the research group Cellular and Molecular Immunology on the new VUB campus (*Oefenplein*). He directed the Institute of Molecular Biology and Biotechnology and was vice-dean of the Faculty of Sciences. His expertise was tumor-associated macrophages, work continued nowadays by Geert Raes and Jo Van Ginderachter.

### The Presidency of Oberdan Leo (2000–2017)

The 21<sup>st</sup> century witnessed an exponential growth of scientific publications, also in the field of Immunology. In 2003, the first human genome was fully sequenced and very rapidly DNA sequencing became 'routine business'. Informatics facilitated greatly the communication and contact among the scientists, and thus the organization of meetings became somewhat less essential. **Oberdan Leo** ( $^{\circ}$ 1955) joined the BIS executive board in 1996 and served as president for more than 15 years. He was professor of Immunology at ULB since 1986, Director from October 2009 to March 2015 and Vice-Rector for Research from October 2018 to 2020. Trained with Jacques Urbain, he later worked mostly on T lymphocytes. Leo's wife **Muriel Moser** is internationally known for her work on dendritic cells. She is former Research Director and Dean of the Faculty of Science at ULB [10]. **Benoit Van Den Eynde** ( $^{\circ}$ 1962) was the longstanding treasurer of the society (with the help of Suzanne Depelchin) from 2003 to 2011. Director of *Ludwig Institute for Cancer Research* (UCL) since January 2010, he is now professor of Tumor Immunology at the University of Oxford since September 2016 and director of de Duve Institute (UCL) since June 2019. **Kris Huygen** ( $^{\circ}$ 1951): joined the BIS board in 1993 and served as secretary from 1998 to 2017. She created and led the service of Immunology at the *Pasteur Institute of Brussels*. Another

BIS board member is **Pierre G. Coulie**, professor at *De Duve Institute-UCLouvain* since 1982. He is *alumnus* of the Editorial Board of *EJI*. Together with **Thierry Boon** (also *EJI alumnus* and Francqui laureate in 1990), he has performed pivotal work on immunotherapy of cancer, with their study of different groups of tumor antigens, recognized by T lymphocytes. **Arnaud Marchant MD** was treasurer from 2012 to 2021. He is a senior scientist at Faculty of Medicine ULB, first at Hôpital Erasme, later at Institute for Medical Immunology IMI in Gosselies. Focus of his research is on infant immune responses and maternal immunization.

### The Executive Board of the BIS (1978–2022)

After its creation forty-four years ago, many Belgian immunologists were members of the Society and of its Executive Board. Initially the BIS organized an annual Spring and an annual Autumn meeting. The abstracts of the communications presented at the meetings in Kortrijk on June 19<sup>th</sup> 1979 and in Namur on November 7<sup>th</sup> 1980 were published (in English) in the *Ann. Immunol. (Institut Pasteur)* (130 C-751-762; 131 D-357-367). Today, BIS has about 200 members from all Belgian Universities and from Research Institutes such as the *Institute for Tropical Medicine ITG* in Antwerp and the *Ludwig Institute for Cancer Research* (previously ICP) in Brussels. Besides oral lectures by invited (often international) speakers, an average of forty posters are presented at the meetings (for a complete list see the BIS website at [www.bims.be](http://www.bims.be)). In 1982 and 2014 the BIS held a joint meeting with the *Société Française d'Immunologie* and in 1988 and 2002 a joint meeting with the *Nederlandse Vereniging voor Immunologie*. Members of the Society participated in the International Immunology Meetings of IUIS and in the annual European Immunology Meetings. Since 2006 BIS has participated as an EFIS member Society in the Joint Meetings of the European National Societies of Immunology, i.e. the triennial European Congress of Immunology ECI (2006 Paris-France; 2009 Berlin-Germany; 2012 Glasgow-United Kingdom; 2015 Vienna-Austria; 2018 Amsterdam-The Netherlands; 2021: virtual/on-line meeting).

**President:** A.D. Strosberg (VUB): 1978–1981; Joseph Wybran (Hôp. Erasme

ULB): 1982–1983; Ben Van Camp (UZ-VUB), 1984–1985; M. Vandeputte (Rega Instituut-KUL): 1986–1987; Jacques Van Snick (Ludwig Institute-UCL): 1988–1989; Alfons Billiau (Rega Instituut-KUL): 1990–1999; Oberdan Leo (ULB): 2000–2017; Bart Lambrecht (IRC-UGent): 2018...

**Secretary:** Marcel Joniau (KULAK): 1978–1981; Ben Van Camp (UZ-VUB): 1982–1983; Etienne Dupont (Hôp. Erasme-ULB): 1984–1987; Michel Goldman (Hôp.Erasme-IMI-ULB): 1988–1995; Patrick De Baetselier: (VUB): 1996–1997; Kris Huygen (Pasteur Instituut Brussels-WIV-ISP): 1998–2017; Marta Romano (Sciensano): 2018...

**Treasurer:** Marc de Bruyère (Saint-Luc-UCL): 1978–1981/ 1984–1985 ; Anne-Marie Lebacq (UCL) 1982–1983 ; Kris Thielemans (UZ-VUB): 1986–1990 ; Jean Plum (UZ-UGent): 1991–1994 ; Georges Leclercq (UZ-UGent): 1995–2002 ; Benoit Van den Eynde (ICP-UCL): 2003–2011 ; Arnaud Marchant (IMI-ULB): 2012–2021 ; Eric Cox (UGent): 2022...

### The other Executive Board members (1982–2022)

**1982–1985:** Jacques Urbain (Institute of Molecular Biology-ULB); Jacques Boniver (CHU-ULiège); Arthur Depelchin (FUNDP-Namur)

**1986–1989:** Pierre-Paul Pastoret (ULiège); Nicole Schaaf-Lafontaine (CHU-ULiège); Wim Stevens (UIA); Geert Leroux (UGent); Jacques Van Snick (ICP-UCL) (President 1988–1989)

**1990\*:** Luc Bouwens (VUB); Marie Paule Defresne (CHU, ULiège); Martine Denis (Fac. Vet. Medicine; Dept. Virology-Immunology; ULiège.); Pierre Masson (ICP-UCL)

**1998:** Guido Vanham (ITG); Hubertine Heremans (Rega Instituut-KULeuven)

**2002:** Eric Cox (UGent)

**2006:** Michel Moutschen (ULiège)

**2010** Stefan Magez (VUB); Dominique Bullens (KULeuven); Vincent Geenen (ULiège); Claude Libert (UGent); Niels Hellings (UHasselt); Johan Grooten (UGent)

**2011:** Pierre Coulie (UCL)

**2015:** Jo Van Ginderachter (VUB)

**2017:** Adrian Liston (KULeuven); Nathalie Cools (UIAntwerpen); Martin Guillems (VUB)

**2022:** David Vermijlen (VUB)

\*Since 1992, board members no longer had to resign after 4 years and many of

them remained in function for a variable, longer period (not documented here)

**As in most Societies, the majority (about 80%) of the BIS board members have been men. The few women who served on the board were (apart from Lise Thiry) Anne-Marie Lebacq (UCL-Immunohematology; Treasurer 1982–1983), Marie-Paule Defresne, Martine Denis, Hubertine Heremans, Nicole Schaaf-Lafontaine, Kris Huygen, and more recently Dominique Bullens, Nathalie Cools and Marta Romano.**

### Recent activities of the Belgian Immunological Society

On November 24<sup>th</sup> 2017 a BIS meeting on Immune Regulation was held at Campus Gasthuisberg KULeuven, organized by A. Liston, S. Schlenner, E. Nieuwenhove and N. Hellings. On that occasion, **Bart Lambrecht** (1968) was elected as a new board member and nominated as the new BIS President. Bart Lambrecht is Professor of Pulmonary Medicine at ErasmusMC and at UGent and the director of the VIB Inflammation Research Center since 2012. Together with his group leader **Hamida Hammad** (member of the *EJI* Executive Committee), he is an international authority in the field of asthma and allergies. In 2014 he received the Francqui prize. In 2018, members of the BIS participated to the ECI in Amsterdam, the Netherlands. There was no BIS meeting planned in 2019 and because of the COVID-19 pandemic, the planned BIS meeting “Fundamental Immunology: feeding the translational pipeline” was canceled in 2020. Several BIS members were actively involved in various ways in the management of this health crisis at the national level [11]. BIS meetings were on hold till June 24<sup>th</sup> 2021 when the BIS co-organized a virtual Interdisciplinary Symposium on COVID-19 (Joint meeting of the Belgian Society of Virology, The Belgian Society of Microbiology, The Belgian Society of Clinical Microbiology and Infectious Diseases and the Belgian Immunology Society). A joined meeting with the *Nederlandse Vereniging voor Immunologie* is planned for 2023. Since 2018 **Marta Romano** (1975) at Sciensano is the new secretary and since 2022, **Eric Cox** is the new treasurer of the BIS. He is the chair of the Department of Virology, Parasitology, Immunology and Physiology of the Faculty of Veterinary Medicine at UGent and since 2021

chair of the Department of Translational Physiology, Infectiology and Public Health at UGent.

Created by immunologists from Flanders, Brussels and Wallonia, English was the language spoken at all BIS meetings. Initially these meetings were financed by the federal Fund for Scientific Research (FWO-FNRS), and later the respective Flemish and French funds took over. Unfortunately the transfer of responsibilities to the two regions also had repercussions on the financing of research, and as of today 'formally co-financed' collaborations between researchers of the two communities are now only possible through BELSPO (Belgian Science Policy). In Flanders, the VIB (the Flemish Institute for Biotechnology) became a major financier for high-tech research of Flemish Universities. Bart Lambrecht, president of the BIS since 2018, is directing the VIB financed *Inflammation Research Centre* (former Institute of Molecular Biology) of Gent University in Zwijnaarde. In Wallonia, the Charleroi region received major European Financing which led to the cre-

ation of the *Institute of Medical Immunology* and the relocation of ULB immunologists from Brussels to Gosselies. Belgium has a privileged central location in Europe and its multilingual status naturally led Belgian scientists to develop collaborations within Europe and abroad. This point is still relevant today, in a country in which federal and regional authorities sometimes forget the proverb *Eendracht maakt macht-L'Union fait la force*. (Speaking of Kafka: since the 6<sup>th</sup> reform of the Belgian State in 2011, 8 ministers/secretaries of State are responsible for public health in Belgium.)

**Marta Romano**<sup>1</sup>, **Marcel Joniau**<sup>2</sup> and **Kris Huygen**<sup>3</sup>

<sup>1</sup> Sciensano, Brussels, 1180

<sup>2</sup> prof.em.KULeuven, Kortrijk, 8500

<sup>3</sup> ex-Pasteur Institute of Brussels-WIV-ISP, Brussels, 1180

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Full correspondence: Kris Huygen,  
huygenkris@gmail.com