出國報告（出國類別：開會）

參加 **2019** 年國際疫苗學會年度會議「**2019 Annual ISV Congress**」

服務機關：行政院衛生福利部疾病管制署
姓名職稱：急性傳染病組 組長　楊靖慧
派赴國家：比利時
出國期間：108 年 10 月 25 日至 10 月 31 日
報告日期：108 年 12 月 3 日

摘要

國際疫苗協會(The International Society for Vaccine， ISV)是一個致力於支持和維持與疫苗相關所有領域的組織。其自 2007 年起，每年會舉辦疫苗國際年度會議。本次 2019 年國際疫苗學會年度會議為其第 13 屆會議，會期 3 天，共計有約 400 人參加，包括各國研究人員、學者專家(如公共衛生、醫療與獸醫相關等)與疫苗廠商代表等共襄盛舉。會議進行的模式是分成 7 個主題段落以及 9 個小主題(每次 3 個主題同時進行)。內容以各種疫苗研發的最新進展為主，包括伊波拉疫苗、結核病疫苗、HIV 疫苗、肺炎鏈球菌疫苗等，會議中並有多篇海報論文展示，讓與會者對目前各項疫苗的最新研發進展與以臨床試驗能夠有完整的了解。本人代表疾病管制署參加會議，以其掌握國際疫苗研發的最新知識。

目錄

壹、開會目的

國際疫苗協會(The International Society for Vaccine， ISV)是一個致力於支持和維持與疫苗相關所有領域的組織。其自 2007 年起，每年會舉辦疫苗國際年度會議。此會議是全球最大的非商業性疫苗相關領域科學會議，參加者包括臨床及基礎研究人員，討論的主題涵蓋傳染病和癌症預防相關的疫苗和免疫療法，包括疫苗基礎研究及人類和動物用疫苗的生產和臨床試驗等議題。本次 2019 年國際疫苗學會年度會議為其第 13 屆會議，本人代表疾病管制署參加本次會議，以其掌握國際疫苗研發的最新知識。

貳、行程表

日期		地點	行程內容
108/10/25 108/10/26	啟程	台北→杜拜 →布魯塞爾→根特	路程（杜拜轉機）
108/10/27 108/10/29	開會	根特	參加會議
108/10/30 108/10/31	路程	根特→布魯塞爾→杜 拜→台北	路程（杜拜轉機）

參、會議內容摘要

此次會期為 3 天，共計約有 400 人參加，包括各國研究人員、學者專家(含括公共衛生、醫療與獸醫相關等)與疫苗廠商代表等共襄盛舉。會議進行的模式是分成 7 個主題段落以及 9 個小主題(每次 3 個主題同時進行)。以下針對部分重要會議內容做介紹。

創造一個讓傳染病流行疫情不再對人類構成威脅的世界(Creating a world in which epidemics are no longer a threat to humanity: the challenges of developing vaccines in the 21st century)

此開場演講者是 Luc Debruyne 教授，他曾任職於 GSK 疫苗公司 27 年，且對國際疫苗產業與研發有 30 幾年的經驗。這次演講的主題主要是介紹其現在任職的創新流行病整備聯盟(Coalition for Epidemic Preparedness Innovations，CEPI)。CEPI 是致力於資助和協調針對傳染病疫苗開發的一個全球聯盟，於 2017 年成立，主要任務是為了研發針對致命流行性傳染疾病的疫苗。起因是 2013 年底開始的伊波拉疫情，這個高傳染性且高死亡率的疾病在西非 3 個國家肆虐，而頻繁的國際旅行增加其傳播的危險，因為沒有有效的治療藥物，WHO 立即宣布此為國際衛生緊急事件(Public health emergencies of international concern，PHEIC)。為了控制疫情，疫苗研發成為當時最重要的任務。其實伊波拉苗的研發始於 1970 年代後期，在 1980 年 Lancet 期刊就發表了一篇不活化疫苗的動物試驗結果。但是因為這個疾病造成的流行疫情非常罕見，並且在 2014 年前疫情都能被迅速控制，因此商業疫苗生產商沒有意願繼續研發疫苗通過臨床試驗。直到 2014 年的西非疫情，因為 WHO 宣布為 PHEIC，以前僅在動物身上測試過的幾種疫苗快速進入臨床試驗，國際知名的疫苗公司都一起投入研發，而且 WHO 也主導研擬了加速臨床試驗的評估程序，終於在 2015 年底據稱能 100%有效預防伊波拉病毒的疫苗「rVSV-ZEBOV」研發上市。該疫苗的原理是通過重新編碼伊

波拉病毒的表面蛋白，將包覆在良性的水疱性口炎（VSV）病毒上。這種疫苗不含活的伊波拉病毒，卻能讓人體產生對伊波拉病毒的免疫反應。不過 rVSV-ZEBOV 疫苗相當脆弱，需要儲存在攝氏零下 60 度到 80 度之間，這對位處熱帶的疫情流行地區是一大挑戰。講者在當年仍任職於 GSK 公司，他提到他們努力的研發並製造出 800 支疫苗，親自送到到疫區，卻發現珍貴的疫苗在當地被隨意的堆在醫院地上，讓他感覺十分的驚嚇且心痛。這個經驗讓專家們了解到，除了研發疫苗外，疫苗的冷運冷藏設備以及第一線醫療人員的訓練也是處理疫情時重要的一環。第一支疫苗上市後不久，隨著西非疫情在 2015 年 5 月宣告結束後，國際投注於伊波拉疫苗研發疫的資源也跟著消失了，研發的腳步就慢了下來。這說明了另一個重要的問題，只有疫情來時才投入研發，常常是緩不濟急。

CEPI 的成立宗旨就是要激勵並加速快針對新興傳染病的疫苗的開發，並在疫情爆發時能讓人們能夠及時使用這些疫苗來降低損害。目前 CEPI 鎖定的致病原有 MERS、Lassa、Nipah、Chikungunya、Rift valley fever 與 Disease X。其實有許多組織投入資金於各種疫苗的研發，但是 CEPI 的主旨是要填補從研發到被人們使用這個過程的許多關鍵差距。首先，CEPI 著手開發針對已知威脅的疫苗，使其能夠通過概念驗證和人類安全性測試，並在疫情流行開始之前建立此類研究性疫苗的儲備以防萬一，just in case (preparedness)。其次，資助新型和創新的技術平台，這些技術有可能加速針對先前未知病原體的疫苗的開發和生產（例如：從鑑定抗原到用於臨床試驗的產品上市僅需 16 週），以便在疫情發生時能夠及時取得疫苗，just in time(response)。第三個部分是支持和協調能改善各國對流行疫情的整體反應的活動(例如教育訓練、研討會)，增強處於危險國家的能力並推進管理產品開發的監管科學，sustainability(持續的資源挹注)。經有此三大目標來協助全世界因應新興傳染病的威脅。

人畜共通傳染病的動物疫苗研發

近年來的新興傳染病，有七成是屬於人畜共通傳染病。除了研發人類可以使用的疫苗外，動物接種疫苗可能是另一個可行的方向。利用病毒載體疫苗是近年相當熱門的技術，使用減毒的牛痘病毒株安卡拉(MVA)製成的病毒載體疫苗已被應用在多種新興傳染病上，其製成的對抗MERS病毒的疫苗已經在駱駝中測試，效果不錯。此次會議中，Sarah Gilbert教授特別提到，利用其研發的腺病毒載體疫苗，發展出同時針對MERS與裂谷熱(Rift valley fever)多價疫苗，接種於駱駝及牛隻以達到保護人類不受感染的初步研究成果。

疫苗接種方式的影響

腸道細菌可能會影響口服疫苗的效果，有研究者發現口服輪狀病毒在不同國家兒童產生的保護效果不一致，進一步發現腸道細菌及腸病毒感染可能會影響抗體的產生。所以各國在推行口服疫免疫計畫時可能要進行相關研究，若真的有影響，可能要考慮是否要減少兒童在口服疫苗接種前暴露於其他感染(例如提前到出生就接種)，或是合併使用針劑注射型疫苗來降低此影響。另一個研究者則提到疫苗使用皮下注射(ID)與肌肉注射(IM)的問題，現行的上市及研發中的疫苗種類，IM約為ID的5倍，但是研究均顯示ID可以有效減少所需的抗原劑量，但是因為施注方式較為困難且疫苗製造商不願意更改劑型等因素，以致無法積極推動。但是面臨新興傳染病時，一開始疫苗無法大量製造，使用最少量的抗原來達到同樣的保護力，是必須要面對的議題。如何改進ID(例如研發新的注射器具等)需要進一步的研究及策略。

新興傳染病的疫苗發展

議程中還有包括TB(結核病)、HIV、Chikungunya、茲卡病毒感染症的疫苗研發的最新進展。此外，還有新的疫苗研發概念與生產技術(例如利用植物來生產疫苗)相關研究、被動免疫如單株抗體等研究結果的發表。

疫苗的獲取：疫苗接種障礙的案例研究(Access to vaccines: cases studies in impediments to vaccination)

最後的演講是由國際疫苗學會(International Vaccine Institute, IVI)主席Jerome Kim教授主講。不同於開場演講談到的新興傳染病的疫苗研發，這裡要談到的是被忽略或使用量低的的已經研發出來的「舊疫苗」。大家都知道疫苗從研發到上市須要經過層層的關卡以及大量資金、時間的投入，通常需要數十年的時間。很遺憾的是有些已經研發出來的疫苗，即使已被證明安全有效，卻因為一些因素而無法上市或大量推廣。Kim教授舉了一些案例來討論。第一類是使用量較低的疫苗，例如昂貴的輪狀病毒疫苗跟結合型肺炎鏈球菌疫苗(PCV)，因為價格的關係使得推廣遇到困難。除了高收入國家以及GAVI贊助的開發中國家，許多中收入國家都無法將其納入國家免疫計畫中，價格成了這類疫苗推廣最重要的阻礙。

而口服霍亂疫苗(Oral Cholera Vaccine, OCV) 則是因為環境的進步以及疫情的消失，使得疫苗使用量逐年降低，引發的結果就是生產量降低，依但疫情發生時無法臨時取得足夠的疫苗。OCV是防治霍亂最重要的武器，尤其是在有霍亂風險或可能發生霍亂流行疫情的地區，以目前OCV的產能可能不足以控制爆發的霍亂疫情。所以，需求量成為此類疫苗推廣的阻礙。為了解決此問題，世衛組織從2013年起，建立了全球口服霍亂疫苗儲備策略，並獲得了疫苗聯盟GAVI的長期支持，許多國家現在也正研擬將OCV的使用納入其霍亂控制計劃中。自2013年建立儲備策略以來，迄今為止（2018年5月）已在19個國家的進行了大規模疫苗接種運動，使用量超過2500萬劑。有了量的需求，才能使疫苗被製造出來而且進一步用到需要的人身上。

另一個案例是E型肝炎疫苗。E型病毒型肝炎每年在全世界造成7萬人死亡，在一些國家造成嚴重疫情，懷孕婦女感染會有高達20-30%的死亡率。而早在2007年起就陸續有E肝疫苗第一期臨床試驗具有很好的保護效益的研究結果在新英

格蘭雜誌等頂級期刊發表。但是，因為後續資源投入不足，許多問題如不同接種對象(孕婦、兒童等) 的安全性、不同型別間的交叉保護效果等都還沒有完整的研究成果，所以WHO的疫苗策略專家諮詢會議(SAGE)遲遲無法作出施種建議。而因為沒有建議，投入研發的資源就更少，所以至今無法順利上市。

講者的結論是疫苗的研發需要大量的資金，雖然可以經由一些策略降低成本，仍是需要外界的資源挹注。疫苗是預防傳染病最好的武器，目前還有很多疾病需要疫苗，有很多疫苗需要進一步臨床試驗，更有一些疫苗需要一定的資源來維持其產能。從人類歷史中，只有天花被消除成功，其他傳染病如小兒麻痺症(雖然經過大規模的接種計畫活動，仍未成功)，而麻疹甚至個案激增，扭轉了過去20年為了根除所做的努力。通過疫苗是根除傳染性疾病的基石，但是要實現這一目標，需要全球各國對此目標下定決心一起努力才能成功。

肆、心得與建議

本屆疫苗國際年度會的內容相當豐富，一共包含7個段落，內容以各項疫苗包括結核病、HIV、屈公病毒等的最新研發結果為主，還有許多學者發表一些創新的研發方向。會議內容比較偏向基礎研究，較適合研發人員來參與。不過經由伊波拉疫苗研發上市的歷程，讓與會者了解到面對新興傳染病應有的因應準備，也了解國際間對此緊急狀況的準備，會議中一直提到伊波拉疫情結束後資源投注的減少，延緩了疫苗研發的腳步，這是國際間常見的現象，我國也不例外。緊急疫情如SARS發生時，政府會投注大量資源來進行防疫，但是幾年後疫情消失就不再持續，可是許多防疫物資設備是需要維護且汰舊換新的。疫苗發展更是如此，因應疫情而研發的疫苗，是很難在當次疫情期間發生效果的，但若是後續就不再支援資源，疫苗要走到上市就會遙遙無期。所以對於新興傳染病的整備計畫，除了因應緊急疫情外，持續的資源投注於平時的整備維護是必要的策略。

除了疫苗研發外，完善的疫苗冷運冷藏系統以及第一線醫護人員的訓練，都是讓疫苗可以發揮最大效用種不可或缺的一環。我國早就注意到這個問題，因此在「我國因應流感大流行準備計畫」中納入季節性流感疫苗接種計畫，其中包含校園及社區等的針對大量民眾的接種活動。一方面可以增加流感疫苗的可近性以便提高接種率，另一方面可以操練第一線醫護及公衛人員，讓其熟悉大量接種計畫的流程，以便因應緊急疫情時的疫苗接種。此外，醫療院所需要定時紀錄疫苗冰箱的溫度，而疾管署偕同地方衛生局定期查核合約疫苗接種醫療院所的冷運冷藏設備，確保疫苗冷鏈的完整性與正確率，這些繁瑣的工作都是為了保障國人接種的疫苗安全無虞，因為醫療與公衛人員的努力，我國疫苗接種計畫的成就是傲視全球的。

另一個感想是有關疫苗使用量與產能的問題，不可否認的疫苗廠商是商業團體，所以利潤是其分配生產線的重要考量之一。沒有足夠銷售量的疫苗其優先順序就會被調降。這個問題在去年的巴西黃熱病疫情但疫苗卻供應不足時就顯現出

來了，當時就有專家建議應該把黃熱病疫苗比照口服霍亂疫苗一樣，以庫存方式保證一定的使用量(產量)，才可以因應緊急疫情。對應國內近幾年的自費疫苗短缺問題，其實是類似的情況。在平時就應該盡力推動疫苗接種以保證一定的需求量，不然遇到緊急需求時是無法立刻取得疫苗的。疫苗庫存的最好方式就是接種在需要的人身上，高接種率產生的群體免疫力才能預防傳染病的入侵，這兩年的國際麻疹疫情就說明了這件事。針對民眾與醫療人員積極推動疫苗接種的效益，除了幼兒公費疫苗維持高接種率外，推廣成人接種我國ACIP委員會推薦的疫苗是因應國際間頻傳的傳染病流行最好的策略。

參加這個會議使我受益良多，建議以後可以多派幾人(包含疫苗研發人員)定期參加，以便獲取更多的新知識與經驗交流。

ORAL PROGRAM

SUNDAY OCTOBER 27, 2019

08:00-19:00	**REGISTRATION**		***(Minneplein)***
09:00-10:00	**WELCOME COFFEE** (SPONSORED BY *GSK*)		***(Minneplein)***
10:00-10:10	**OPENING REMARKS** **ISV Congress co-Chairs: Linda Klavinskis**, *Kings College London*; **Ted Ross,** *University of Georgia*; **Xavier Saelens,** *University of Ghent*		***(Auditorium)***
10:10-12:00	**OPENING SESSION** **PLENARY SESSION 1: Emerging Infectious/Neglected Diseases – Are We Making Progress?** **Session Chairs: David Weiner,** *Wistar Institute*; **Linda Klavinskis,** *King's College London*		***(Auditorium)***
10:10-10:45	**KEYNOTE SPEAKER** **Creating a world in which epidemics are no longer a threat to humanity: the challenges of developing vaccines in the 21st Century** Luc Debruyne**,** *Coalition for Epidemic Preparedness Innovations (CEPI)*		
10:45-11:10	**[PL1.1] Rapid emerging infectious disease response utilizing a measles vaccine vector platform** Katrin Ramsauer, *Themis Bioscience GmbH*		
11:10-11:35	**[PL1.2] Viral Vectors as a Platform Technology for Emerging Pathogen Vaccines** Sarah Gilbert, *Jenner Institute*		
11:35-12:00	**[PL1.3] Recent Advances in Tuberculosis Vaccine Development** Ann Ginsberg, *IAVI*		
12:00-13:30	**LUNCH** (SPONSORED BY *IMBCAMS*)		***(Banquet Room)***
13:30-15:05	**PLENARY SESSION 2: Personalized Cancer Vaccines - Why Being Different is Good** **Session Chairs: Annie DeGroot,** *EpiVax;* **Jeffrey Ulmer,** *GlaxoSmithKline (GSK)*		***(Auditorium)***
13:30-13:55	**[PL2.1] Development of neoantigen-specific cancer vaccines: From prediction of neoantigens to development of a potent vaccine** Karin Jooss, *Gritstone Oncology, Inc.*		
13:55-14:20	**[PL2.2] Discovery of actionable tumor antigens presented by MHC class I molecules** Claude Perreault, *Université de Montréal*		
14:20-14:35	**[PL2.3] Nouscom personalized and off-the-shelf vaccines encoding many cancer neoantigens to cure large solid tumors, in combination with checkpoint inhibitors** Maria Teresa Catanese, *Nouscom SRL*		
14:35-14:50	**[PL2.4] Active immunization with PD1-derived B cell mimotope - New strategies in cancer immunotherapy against Her-2/neu-expressing tumors** Joshua Tobias, *Medical University of Vienna*		
14:50-15:05	**[PL2.5] In vivo expression of plasmid encoded IgG for immune check point targets by synthetic enhanced DNA as a new tool for cancer immunotherapy** Kar Muthumani, *The Wistar Institute*		
15:05- 15:35	**COFFEE BREAK** (SPONSORED BY *PFIZER*)		***(Minneplein)***
15:35-17:55	**CONCURRENT SESSION 1** ***(Room Jan Van Eyck)*** **Structural and Computational Vaccine Design** **Session Chairs:** **Xavier Saelens** *University of Ghent* **Lenny Moise** *University of Rhode Island*	**CONCURRENT SESSION 2** ***(Room Hubert Van Eyck)*** **What's New in Vaccine Formulations and Delivery** **Session Chairs:** **Anna-Lise Williamson** *University of Capetown* **Karl Ljungberg** *Eurocine Vaccines*	**CONCURRENT SESSION 3A** ***(Room Van der Goes)*** **HCMV Vaccines – Current Status & Future Projects** **Session Chair:** **Stanley Plotkin** *VaxConsult LLC*

15:35-16:00	**[O1.1]** **Trivalent cocktail of de novo designed immunogens enables the robust induction and focusing of functional antibodies in vivo** Bruno Correia *Laboratory of Protein Design & Immunoengineering (LPDI)*	**[O2.1]** **Polymeric adjuvants for enhanced vaccine induced cellular immunity** Ed Lavelle *Trinity College Dublin*	**[O3.1]** **Prospects for Vaccination Against Cytomegalovirus** Stanley Plotkin *Vaxconsult LLC* →15:35-15:55←
16:00-16:25	**[O1.2]** **Making use of human monoclonal antibodies for the prevention and treatment of viral diseases** Davide Corti *Institute for Research in Biomedicine (IRB)*	**[O2.2]** **Composite Virus-like particles (VLP) by constructing intelligent artificial nano/micro "chassis" assembled with antigens** Guanghui Ma *Chinese Academy of Sciences (CAS)*	**[O3.2]** **CMV: State-of-the-art approach to prophylaxis** Fabienne Piras-Douce *Sanofi Pasteur* →15:55-16:15←
16:25-16:40	**[O1.3]** **Immunogenicity of ultrastable HIV-1 native-like envelope trimers** Ivan del Moral Sánchez *Amsterdam UMC, Academic Medical Center*	**[O2.3]** **Bridging systemic and gastrointestinal immune responses for enhanced vaccinations** Yufei Xia *Chinese Academy of Sciences (CAS)*	**[O3.3]** **Clinical Immunogenicity Profile of Cytomegalovirus Vaccine V160** Dai Wang *Merck* →16:15-16:35←
16:40-16:55	**[O1.4]** **Co-display of hyperstabilized HIV-1 envelope glycoprotein trimers on two-component protein nanoparticles** Mitch Brinkkemper *Amsterdam UMC*	**[O2.4]** **Microneedle vaccination against Zika virus confers enhanced cellular and humoral immunity while protecting immune privileged compartments** Ioanna Skountzou *Emory University*	**[O3.4]** **Development of a subunit based CMV vaccine** Kirsten Schneider-Ohrum *GSK* →16:35-16:55←
16:55-17:10	**[O1.5]** **Innovative HIV-1 Nanovaccine Adjuvanted with Army Liposome Formulation: Glycosylated V1V2 Envelope Proteins Displayed on a Self-Assembling Protein Nanoparticle** Zoltan Beck *Walter Reed Army Institute of Research* *Henry M Jackson Foundation*	**[O2.5]** **Th17-polarizing mucosal CTA1-DD adjuvant generates highly protective CD4 T-cell responses when used in combination with a universal flu vaccine candidate** Li Ching Ong *University of Gothenburg*	**[O3.5]** **Vaccine efficacy against genital HSV-1 and HSV-2 infection and immune correlates of protection for an HSV-2 gC2/gD2/gE2 trivalent nucleoside-modified mRNA-LNP vaccine for genital herpes** Harvey Friedman *University of Pennsylvania* →16:55-17:10←
17:10-17:25	**[O1.6]** **Reconstitution of a Dengue virus neutralizing epitope** Chen Piller *Tel Aviv University*	**[O2.6]** **A built-in adjuvant-engineered mucosal vaccine against Fusobacterium nucleatum and Porphyromonas gingivalis inhibits dysbiotic periodontal diseases in a mouse model** Joon Haeng Rhee *Chonnam National University*	**CONCURRENT SESSION 3B** ***(Room Van der Goes)*** **Emerging Infectious Disease Vaccines: Clinical Studies** **Session Chair:** **Sarah Gilbert** *Oxford University*

17:25-17:40	**[O1.7]** **Dengue and Zika virus domain III-flagellin fusion and glycan-masking E antigen for prime-boost vaccine immunization** Suh Chin Wu *Institute of Biotechnology* *National Tsing Hua University*	**[O2.7]** **TriMix based mRNA immunotherapies** Stefaan De Koker *eTheRNA immunotherapies*	**[O3.6]** **Ad26.ZIKV.001 induces durable humoral immune responses in humans that confer high levels of passive protection in a murine Zika virus challenge model** Nadine Salisch *Janssen Vaccines B.V.* →17:10-17:25←
17:40-17:55	**[O1.8]** **Presenting novel soluble hepatitis C virus E1E2 glycoproteins on a designed two-component nanoparticle to enhance immunogenicity** Kwinten Sliepen *Amsterdam UMC* *University of Amsterdam*	**[O2.8]** **Mucosal immunity induced by the intranasal delivery/adjuvant NanoVaxTM -formulated vaccine protected animals from respiratory and genital infections. A promising path to improving efficacy of existing vaccines and developing a past overdues ones.** Ali Fattom *Bluewillow Biologics*	**[O3.7]** **Development of a single-shot live-attenuated Chikungunya vaccine: A Phase 1 randomized clinical trial in healthy adults.** Nina Wressnigg *Valneva Austria* →17:25-17:40←
			[O3.8] **A synthetic, consensus DNA vaccine against Middle East Respiratory Syndrome coronavirus (MERS-CoV), GLS-5300, induces robust humoral and cellular immune responses in humans** Emma Reuschel *The Wistar Institute* →17:40-17:55←
17:55-19:00	**POSTER SESSION # 1**		***(Minneplein)***
18:30-20:00	**WELCOME RECEPTION** (SPONSORED BY *EPIVAX*)		***(Minneplein)***

MONDAY OCTOBER 28, 2019			
07:30-08:00	**MORNING COFFEE** (SPONSORED BY *HIVF*) ***(Minneplein)***		
08:00-09:45	**PLENARY SESSION 3: Influence of the Microbiome Shaping the Immune Response to Vaccines** ***(Auditorium)*** **Session Chairs: Beate Kampmann,** *London School. of Hygiene and Tropical Medicine (LSHTM)* **Margaret Liu,** *ProTherImmune*		
08:00-08:25	**[PL3.1] Modulation of Host Immunity by Targeting Gut Microbiota** Sin-Hyeog Im, *Pohang University of Science and Technology (POSTECH)*		
08:25-08:50	**[PL3.2] The Microbiome and HIV Vaccine Response Heterogeneity** James Kublin, *Fred Hutchinson Cancer Research Center*		
08:50-09:15	**[PL3.3] The intestinal microbiota and oral vaccine immunogenicity** Nick Grassly, *Imperial College London*		
09:15-09:30	**[PL3.4] Impact of the gut microbiota on rotavirus vaccine response in Indian, African and European infants: a prospective cohort study** Edward Parker, *London School of Hygiene and Tropical Medicine (LSHTM)*		
09:30-09:45	**[PL3.5] Two-year Follow-up Results of an Extra-Intestinal Pathogenic E. Coli Vaccine in Healthy Adults: ESTELLA, a Phase 2 Randomized Study** Wouter Haazen, *Janssen Research & Development*		
09:45-10:15	**COFFEE BREAK** (SPONSORED BY *JANSSEN*) ***(Minneplein)***		
10:15-12:20	**CONCURRENT SESSION 4** ***(Room Jan Van Eyck)*** **Vaccines for Respiratory Infections** **Session Chairs:** **John Oxford** *Queen Mary College* **Stephen Kent** *Doherty Institute*	**CONCURRENT SESSION 5** ***(Room Hubert Van Eyck)*** **HIV Vaccines – Are We Making Progress?** **Session Chairs:** **Jerome Kim** *International Vaccine Institute* **Hanneke Schuitemaker** *Jansen Vaccines & Prevention*	**CONCURRENT SESSION 6** ***(Room Van der Goes)*** **Third Generation Vaccines (RNA & DNA Vaccines)** **Session Chairs:** **Maria Issagouliantis** *Karolinska Institute* **Shan Lu** *UMASS Medical School*
10:15-10:40	**[O4.1]** **The current TB vaccine pipeline and the TB Vaccine Development Pathway** Gerald Voss *Tuberculosis Vaccine Initiative (TBVI)*	**[O5.1]** **Cleavage-independent HIV-1 Env trimers elicit cross-neutralizing antibodies at multiple sites of vulnerability** Richard Wyatt *The Scripps Research Institute*	**[O6.1]** **A novel DNA vaccine aiming to quench emerging pandemic threats** Gunnveig Grødeland *University of Oslo*
10:40-11:05	**[O4.2]** **Augmented germinal center formation underpins enhanced immunogenicity of self-assembling protein nanoparticle vaccines for influenza** Stephen Kent *University of Melbourne*	**[O5.2]** **Advancing a global HIV vaccine candidate through the development pipeline** Hanneke Schuitemaker *Janssen Vaccines & Prevention*	**[O6.2]** **Infectious RNA vaccine protects against Chikungunya virus infection** Karl Ljungberg *Eurocine Vaccines* →10:40-10:55←
11:05-11:20	**[O4.3]** **Respiratory Infection Vaccines** Natalie Mazur *UMC Utrecht*	**[O5.3]** **Aiming for protective T-cell responses: A focus on the conserved regions of the HIV-1** Tomas Hanke *University of Oxford*	**[O6.3]** **Development of a dual-target rabies/yellow fever vaccine candidate** Kai Dallmeier *KU Leuven* →10:55-11:10←

11:20-11:35	**[O4.4]** **Memory B-cell recall responses following quadrivalent influenza vaccination** Rodrigo Abreu *Center for Vaccines and Immunology* *University of Georgia*	**[O5.4]** **Comparison of monoclonal antibodies induced by HIV-1 envelop glycoprotein immunization and SHIV infection in non-human primates** Jelle van Schooten *Amsterdam UMC* *University of Amsterdam*	**[O6.4]** **Efficacy of a subunit DNA vaccine adjuvanted with 7HP349, an integrin activator, in controlling Trypanosoma cruzi infection** Nisha Garg *University of Texas Medical Branch* →11:10-11:25←
11:35-11:50	**[O4.5]** **An H1N1 COBRA-based influenza vaccine strategy elicits unique potent broadly neutralizing antibodies against hemagglutinin** Giuseppe Andrea Sautto *Center for Vaccines and Immunology* *University of Georgia*	**[O5.5]** **Pre-clinical and Clinical Development of HIV-1 Envelope Designs Expressed in a Replication Competent Ad4 Vector for Intranasal Administration** Mark Connors *NIAID*	**[O6.5]** **Development of a potent Synthetic DNA vaccine targeting Lyme disease** Trevor Smith *Inovio Pharmaceuticals* →11:25-11:40←
11:50-12:05	**[O4.6]** **Antibodies targeting the RSV SH or influenza M2 proteins engage macrophages to take up infected cells.** Bert Schepens *Ghent University and VIB*	**[O5.6]** **Low-level HIV Gag-p24 antigen persistence in the lymph nodes of Fiebig stage I treated HIV-infected individuals correlates with efficient GCTfh help to B cells** Omolara Baiyegunhi *Africa Health Research Institute*	**[O6.6]** **A Single Amino Acid Change Impacts the Immunogenicity and Efficacy of Modified mRNA-Based Zika Vaccines in Pre-Clinical Animal Models** Kapil Bahl *Moderna* →11:40-11:55←
12:05-12:20	**[O4.7]** **Influenza virus infection and immunization induces high titer cross-reactive HA-specific ADP and monocyte infection-enhancing responses in macaques** Gerrit Koopman *Biomedical Primate Research Centre*	**[O5.7]** **SHIV162P3 transmission by semen leukocytes is efficiently inhibited by a combination of broad neutralizing antibodies** Mariangela Cavarelli *CEA*	**[O6.7]** **Impact of vaccine-induced anti-V2 antibodies on virus control in SHIVBaL.P4 challenged rhesus macaques** Miroslaw Gorny *New York University School of Medicine* →11:55-12:10←
12:20-13:30	**LUNCH** (SPONSORED BY *GLOBAL HIV VACCINE ENTERPRISE*)		***(Banquet Room)***
13:30-15:00	**POSTER SESSION 2**		***(Minneplein)***
14:00-15:00	**ISV ANNUAL GENERAL MEETING**		***(Jan Van Eyck)***
15:00-15:30	**COFFEE BREAK** (SPONSORED BY *THE NATIVE ANTIGEN COMPANY)*		***(Minneplein)***
15:30-17:35	**PLENARY SESSION 4: Profiling the Immune Response to Vaccination During the Life Course – Why Age and Route of Immunization Matters** **Session Chairs: Denise Doolan,** *James Cook University*; **Adrian McDermott,** *NIAID/NIH*		***(Auditorium)***
15:30-15:55	**[PL4.1] Vaccination in the context of immune ontogeny** Beate Kampmann, *London School of Hygiene & Tropical Medicine (LSHTM)*		
15:55-16:20	**[PL4.2] Preventing pneumococcal infections from birth to just before the grave** David Goldblatt, *Institute of Child Health, University College London*		

16:20-16:35	**[PL4.3] Inactivated poliovirus adjuvants the innate response to acellular pertussis booster vaccination via TLR8 sensing on myeloid dendritic cells and non-classical monocytes** Joshua Gillard, *Radboud University Medical Center*
16:35-16:50	**[PL4.4] Maternal immunization- An update where we stand with protecting neonates and young infants from infectious diseases** Kathrin Jansen, *Pfizer Inc*
16:50-17:05	**[PL4.5] Immune system development varies according to age, location and anemia in African children** Danika Hill, *Babraham Institute*
17:05-17:20	**[PL4.6] Harnessing innate immune memory induced by vaccine prime : timing and route of administration matter** Yanis Feraoun, *CEA Paris-Saclay*
17:20-17:35	**[PL4.7] The route of vaccine administration affects early immunity with consequences on the quality of the long-term response** Frederic Martinon, *CEA - Université Paris Sud 11 - Inserm U1184*
17:50-18:10	**BUS PICK UP FOR GALA DINNER**
18:30-22:00	**GALA DINNER** (SPONSRED BY *VGXI* AND *IMBCAMS*) ***TICKETS REQUIRED***

TUESDAY OCTOBER 29, 2019			
07:30-08:00	**MORNING COFFEE** (SPONSORED BY *TAYLOR & FRANCIS*) ***(Minneplein)***		
08:00-10:00	**PLENARY SESSION 5: Next Generation Tools and Technologies for Vaccine Development** ***(Auditorium)*** **Session Chairs: Jonathan Gershoni,** *Tel Aviv University;* **Kathrin Jansen,** *Pfizer, Inc*		
08:00-08:25	**[PL5.1] Immunogenetic analyses of B cell responses following influenza immunization** Adrian McDermott, *NIH*		
08:25-08:50	**[PL5.2] Preparing for Disease X: Developing a Rapid Response Vaccine Pipeline** Paul Young, *University of Queensland*		
08:50-09:05	**[PL5.3] High-throughput mapping of B-cell receptor sequence to antigen specificity** Ian Setliff, *Vanderbilt University Medical Center*		
09:05-09:20	**[PL5.4] Modulation of Burkholderia pseudomallei Immune Responses by Human-like T cell Epitopes have Implications for Vaccine Design** Lenny Moise, *Epivax, Inc.*		
09:20-09:35	**[PL5.5] Proteome-wide screening identifies novel Plasmodium antigens which are effective targets of cross-species protective immunity against malaria** Denise Doolan, *James Cook University*		
09:35-09:50	**[PL5.6] Using Plants to Make a Decavalent Human Papillomavirus Virus-Like Particle Vaccine Candidate** Edward Rybicki, *Biopharming Research Unit, University of Cape Town*		
09:50-10:20	**COFFEE BREAK** (SPONSORED BY *VALNEVA AUSTRIA GmbH*) ***(Minneplein)***		
10:20-11:40	**CONCURRENT SESSION 7** ***(Room Jan Van Eyck)*** **Emerging Infectious Diseases Vaccines: Pre-Clinical, Are We Making Progress?** **Session Chairs:** **Randy Albrecht** *Icahn School of Medicine at Mt. Sinai* **Gary Kobinger** *Research Centre on Infectious Diseases, Université Laval*	**CONCURRENT SESSION 8** ***(Room Hubert Van Eyck)*** **Viral Vaccine Vectors** **Session Chairs:** **Antonella Folgori** *Okairos* **Frederick Tangy** *Institute Pasteur*	**CONCURRENT SESSION 9** ***(Room Van der Goes)*** **★Bright Sparks in Vaccinology★ (Junior Researcher Session)** **Session Chairs:** **Linda Klavinskis,** *King's College London* **Joon Haeng Rhee,** *Chonnam National University*
10:20-10:45	**[O7.1]** **A hundred Intradermal injections of vaccine per second evaluated against Ebola, CCHF and HIV** Gary Kobinger *Research Centre on Infectious Diseases, Université Laval*	**[O8.1]** **Vaccination with recombinant measles virus vaccine controls SHIV infection and strongly reduces reservoir establishment in macaques** Frederick Tangy *Institut Pasteur - CNRS*	**[O9.1]** **Systems vaccinology of YF17D immunization in mice** Ji Ma *KU Leuven* →10:20-10:30←
10:45-11:00	**[O7.2]** **Effect of vaccine vectors on antibody responses to Ebola virus glycoprotein in non-human primates: Can Ebola vaccines have universal immune correlates of protection?** Alexander Bukreyev *University of Texas Medical Branch at Galveston, Galveston National Laboratory*	**[O8.2]** **Development of Single Dose Vaccines against Emerging and Reemerging Infectious Diseases Using a Novel MVA-VLP Vector** Farshad Guirakhoo *GeoVax, Inc.*	**[O9.2]** **Potent immunogenicity and protective efficacy of a multi-pathogen vaccine targeting Filoviruses and an Arenavirus.** Hannah Sharpe *University of Oxford* →10:30-10:40←

11:00-11:15	**[O7.3]** **NS1 DNA vaccination protects against Zika infection through T cell mediated immunity in immunocompetent mice** Branka Grubor-Bauk *University of Adelaide*	**[O8.3]** **A gorilla adenovirus-based vaccine against Zika virus confers protection in immunocompromised and immunocompetent mouse pregnancy models** Ahmed Hassan *Washington University in St. Louis*	**[O9.3]** **The effect of individual differences of vaccine recipients on the humoral immune response after the second primary immunization with inactivated tick-borne encephalitis vaccines based on the far eastern viral strains** Liubov Chernokhaeva *FSBSI* *Chumakov FSC IBP RAS* →10:40-10:50←
11:15-11:30	**[O7.4]** **A Chimeric Live-attenuated Zika/Japanese encephalitis Virus (ZIK-JEprM/E) Vaccine Protects Against Both JEV and ZIKV** Niraj Mishra *KU Leuven*	**[O8.4]** **Preclinical immunogenicity evaluation of a therapeutic hepatitis B vaccine candidate based on chimpanzee adenoviral vector / MVA vector prime-boost regimen, administered with AS01 adjuvanted HBc-HBs proteins in the AAV-HBV-transduced HLA-A2/DR1 mouse model.** Babak Bayat *GSK*	**[O9.4]** **Single dose vaccination with a hepatotropic Adeno-associated virus (AAV) efficiently localises T cell immunity in the liver with the potential to confer rapid protection against hepatitis C virus (HCV)** Makutiro Masavuli *University of Adelaide* →10:50-11:00←
11:30-11:45	**[O7.5]** **Intradermal vaccine INO-4700 is dose-sparing and prevents against disease in Middle East Respiratory Syndrome coronavirus (MERS-CoV) infected rhesus macaques** Ami Patel *The Wistar Institute*	**[O8.5]** **Army Liposome Formulations Induce Durable Binding and Functional Antibody Responses to HIV-1 Envelope gp120 Protein** Mangala Rao *USMHRP, Walter Reed Army Institute of Research*	**[O9.5]** **Infection-permissive immunity against influenza virus provided by vaccination prevents loss of alveolar macrophages and modulates virus-induced cross-reactive immune responses during subsequent influenza infections.** Angela Choi *Icahn School of Medicine at Mount Sinai* →11:00-11:10←
			[O9.6] **Using an aerosol human BCG infection model in healthy, BCG-naïve, UK adults to define the early innate immune response in the lung and systemic circulation** Julia Marshall *Jenner Institute, The University of Oxford* →11:10-11:20←

			[O9.7] **Next Generation COBRA hemagglutinin-based vaccines elicits broadly reactive antibodies against a panel of H5Nx viruses** Ivette Nunez *University of Georgia* →11:20-11:30←
			[O9.8] **Whole genome sequencing uncovers genome diversity and genetic variation in neonatal invasive GBS isolates of the same clonal group** Sindiswa Lukhele *Respiratory and Meningeal Pathogens Research Unit* →11:30-11:40←
11:45-12:45	**LUNCH** (SPONSORED *BY INOVIO PHARMACEUTICALS*)		***(Banquet Room)***
12:30-13:45	**Career Development Panel** Celine Carrat, *EMBO Molecular Medicine*; Ravi Degun, *Navigant Consulting*; Katrin Ramsauer, *Themis Bioscience;* Tom Dyrberg, *Novo Ventures*; Elisabeth Mahase, *The British Medical Journal;* Jan Staelens, *VIB*		***(Jan Van Eyck)***
12:45-13:45	**SESSION 6: LATE BREAKER ORAL ABSTRACTS** **Session Chairs: Pierre van Damme,** *University of Antwerp*		***(Auditorium)***
12:45-13:00	**[LB10.1] Ancer-designed self-amplifying RNA neo-epitope vaccine elicits anti-tumor T cell immunity** Annie DeGroot, *Epivax*		
13:00-13:15	**[LB10.2] Comparison of biological characteristics of HSV2 mutant strain RL1-HSV2, LAT-HSV2, RL1-LAT-HSV2** Lei Liu, *Institute of medical Biology, Chinese Academy of Medical Science and Peking Union Medical College*		
13:15-13:30	**[LB10.3] A novel vaccine targeting the viral protease cleavage sites protects Mauritian cynomolgus macaques against vaginal SIVmac251 infection** Ma Luo, *The Public Health Agency of Canada, PHAC/ASPC*		
13:30-13:45	**[LB10.4] Assessment of Antibody Functional Affinity using ImmunSpot®** Greg Kirchenbaum, *Cellular Technology Limited*		
13:50-14:00	**ISV Award Ceremony**		***(Auditorium)***
14:00-15:30	**CLOSING SESSION 7: Walking Towards the End Game for Disease Eradication** **Session Chair: Ted Ross,** *University of Georgia*		***(Auditorium)***
14:00-14:25	**[CL7.1] Walking Towards the End Game for Poliomyelitis Eradication: development of a new oral polio vaccine** Pierre Van Damme, *University of Antwerp*		
14:25-14:50	**[CL7.2] Is Africa missing opportunities for delivering life-saving vaccines to her children?** Charles Shey Wiysonge, *South African Cochrane Centre*		
14:50-15:15	**[CL7.3] Access to Vaccines: cases studies in impediments to vaccination** Jerome Kim, *International Vaccine Institute*		
15:15-15:30	**CLOSING REMARKS AND INTRODUCTION TO 2020 CONGRESS**		***(Auditorium)***