MTR/REG 622: New Trends in Medicine and Vaccine Discovery

**Fall 2023**

Wednesdays, 3:30-6:30pm

Location: classroom 8030 on the 8th floor of Maloney, HUP

## Course Director:

Name: Claudine Bruck, Ph.D.

Title: CEO Prolifagen, Former Vice-President, Ophthalmology Discovery Unit, GlaxoSmithKline

Email: [clemb11@gmail.com](mailto:clemb11@gmail.com)

Phone: 484-919-1260

## Course Coordinator:

Name: Esther Martin

Office: 8040 Maloney

Email: [estanne@pennmedicine.upenn.edu](mailto:estanne@pennmedicine.upenn.edu)

# Description and desired results:

The purpose of this course is to provide an overview of drug and vaccine discovery, with emphasis on

* Technologies that empower drug and vaccine discovery.
* Newer treatment modalities beyond small molecule drugs
* Recent areas of progress: new vaccine technologies, rare diseases, immuno-oncology, precision medicine, biomarkers and diagnostics, artificial intelligence
* The regulations governing medicine discovery and development
* Business aspects, building start-up biotechs from academic research
* Societal aspects, from affordability to healthcare company considerations to medicine pricing
* How leadership skills impact your success in biotechnology

Students will be guided through these topics by a group of experts who will discuss their experience in the field. While learning this content, students will be taught to interrogate and interpret scientific literature as well as present a scientific topic to an audience. At the end of this course, students will have a broad view of the creative, regulatory and business-related aspects of modern medicine discovery and development and be primed to participate in this process.

Students will be evaluated by their performance in class discussions, case studies, virtual discussion threads, 2 presentations, and an original paper requiring a literature search. Some basic knowledge in molecular biology is desirable at the start.

# Schedule of lectures, activities and speakers

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| Date | Theme | Speaker(s) | Assignments | Description |
| Sept 6 | Introduction to Drug Development and Scientific Roles | •Rick Keenan PhD  •Claudine Bruck, PhD  Former Vice President Ophthalmology TA, GSK;  CEO Prolifagen |  | Students will be led through the development of a newer class of diabetes medicines, learning about the different steps ultimately on the path to registration of a new medicine, from target discovery to preclinical and clinical development. The course uses a literature-based approach, teaching students to follow the development of new medicines based on scientific literature. The lecture will be followed by a discussion of the different scientific roles in this process. |
| Sep 13 | Artificial Intelligence in Drug Development &  AI search engines as a resource | •Claudine Bruck, PhD  •Pankaj Agarwal, PhD  Chief Computat. Biologist, BioInfi | Assignment: discussion Thread on CRISPR/Cas | Value of AI and big data in drug discovery:  1. Discuss the terms and technologies behind AI and big data  2. Present and discuss recently published examples of AI's impact in drug discovery.  3. Discuss how to evaluate scientific papers and claims based on AI.  Goals: be conversant with AI terminology, learn to effectively use AI search tools while developing a critical  Appreciation of the strengths and weaknesses of the claims based on ai methods. |
| Sep 20 | Historical Perspective on AIDS Drug and Vaccine Development | •Claudine Bruck, PhD | Assignment:  Discussion Thread on HIV  *Pre-read a recent article on vaccine technologies* | The lecturer will share her experience in drug and vaccine discovery to HIV, having been an active player in the field from 1985-1995.  The lecture will cover all steps from the early observations of unusual infections to the discovery of HIV and the development of HAART treatment regimens. The societal aspects of the HIV epidemic will also be addressed. |
| Sep 27 | HPV Vaccine Development  In class Case Study | •Claudine Bruck, PhD  •Gary Dubin, MD,PhD  Senior Vice President and Head, Medical Affairs & Policy, Takeda Vaccines | **Due**:  **Discussion Thread on CRISPR/Cas** | Students will learn the process of development of a novel vaccine, from preclinical to clinical development, by lecturers who were active players in this field |
| Oct 4 | Development of Biological Medicines: Proteins / monoclonal antibodies | •Claudine Bruck, PhD  •Meredith Hans Moore, PhD, Vice-President, Tremfya global compound development team leader,  The Janssen Pharmaceutical Companies of Johnson & Johnson  •Bruno Marques, PhD  Sr. Director, Process & Product Development · ‎Century Therapeutics |  | Biologicals, such as monoclonal antibodies (mAb), are an important and growing class of medicines for a variety of indications.  Meredith Hans Moore will share her experience with development of a classical biological medicine Tremfya (a monoclonal antibody to IL-23) from the biological and medical perspective.  Biomanufacturing processes play a major role in the pharmaceutical industry’s ability to deliver these products to patients effectively and economically. Bruno Marques’ lecture will provide an overview of the key elements of mAb production. He will also describe the controls to be performed in order to satisfy regulatory requirements. |
| Oct 11 | Societal Aspects: Payers, Drug Pricing and Affordability  Working in a company environment: teamwork and leadership skills – part 1 | •Claudine Bruck, PhD  •Lawson MacArtney, DVM, PhD, FRCPath  Former Chief Executive Officer and President of Ambrx, Inc.  •Letizia Amadini-Lane  PharmD; Founder & CEO of the LAL Group |  | Lawson MacArtney will walk the students through the different parameters affecting drug pricing, issues related to the high price of medicines and discuss possible future developments in this domain.  Climbing the ladder in the industry environment involves skills above scientific prowess and IQ. Through an interactive course, Letizia will create awareness if this by sharing some of her knowledge as an executive coach.. |
| Oct 18 | Gene Therapy;  Rare Diseases;  Cell Therapies and Regenerative Medicine  Introduction to Drug Repurposing | •Claudine Bruck, PhD  • Karen Kozarsky,PhD  Founder and CSO SwanBio  •Carlo Russo,MD  Chief Medical Officer Genenta Science | Assignment:  Discussion Thread on Rare Diseases | Active players in the field of gene therapy and rare diseases will illustrate the recent development of gene and cell therapy medicines and the role they can play in modern medicine, including in the treatment of rare diseases. |
| Oct 25 | Patient characterization/  Biomarkers/Diagnostics and Precision Medicine  Overview of cell and Gene Therapy CMC aspects | •Claudine Bruck, PhD  •Ruth Tal-Singer, PhD  xxxx  •Bruno Marques, PhD | **Due: Rare Diseases Discussion Thread** |  |
| Nov 1 | Regenerative Medicine  Overview of General Regulatory Processes | •Claudine Bruck, PhD  •Yolanda Sanchez, PhD  Scientific Consultant and Expert in Residence, Pharma and Biotech  Former Vice President, Respiratory Therapy Area and Head, Stress and Repair Discovery Performance , GSK  •Amy Ebel, PharmD  Global Strategic Labeling Head at GlaxoSmithKline | Assignment  for 11/23  Precision medicine paper | Yolanda Sanchez will describe interesting new technologies applied to organ regeneration medicine development. Claudine Bruck will detail an example of a regenerative medicine approach applied to cardiac regeneration.  Amy Ebel will describe the role of regulatory agencies in drug and vaccine development, the path to regulatory approval of a medicine and general regulatory processes. |
| Nov 8 | Drug repurposing student presentations  5 pm: Hot Topic Immuno-Oncology – “From therapeutic vaccines to immune checkpoint blockade to CAR-T therapies” | •Claudine Bruck, PhD  •Jeremy Waight, PhD  ‎Scientific Director, Immuno-Oncology, GlaxoSmithKline | **Due: Drug Repurposing Presentations**  Assignment for Nov 30: Topic selection for final presentation | Students will be asked to present examples of drug repurposing they will gather from the scientific literature.  Jeremy Waight will share recent progress in immuno-oncology, where the harnessing of successful attack of invasive cancers by patients’ immune functions has led to spectacular anti-tumor efficacy. |
| Nov 15 | Drug Labeling, in class exercise and final de-brief  Working in a company environment: teamwork and leadership skills – part 1 | •Claudine Bruck, PhD  •Amy Ebel, PharmD    •Letizia Amadini-Lane |  | This lecture will focus on the drug label, the process by which a drug label is built by pharma companies and controlled by the FDA.  Continuation of October 11 course. |
| Nov 22 | **No course (Thanksgiving break)** |  | **Due: Precision Medicine Paper** |  |
| Nov 29 | Medicines, Vaccines, Diagnostics, Science and Business | •Claudine Bruck, PhD  •Medha Kapil  •Brian McDonald, MD, ChD, PhD, Senior Advisor and Director, Disc Medicine | **Due: Discuss topic of student presentation in class** | Dr. Kapil will describe the process by which scientific discoveries in an academic environment can lead to the successful formation of new biotechnology companies.  Dr. McDonald will discuss his own experience as a founder of Merganser and Dodeca through an interactive session. |
| Dec 6 | Final Student Presentations | •Claudine Bruck, PhD | **Due: Student Presentations** | Students will be asked to present on a topic pre-agreed with the Course Director.  Interactive session, discussion on impact of changing landscape of medicines and vaccine development |
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# Evaluation and Due Dates:

The following table is a quick reference guide for assignments, due dates, and percent of course grade for each. More detailed information about each assignment is listed below. Please note that assignment criteria are subject to change.

|  |  |  |
| --- | --- | --- |
| Activity or Assignment | Due Date (2023) | Evaluation % |
| Participation (in person discussion and case studies and online discussion threads) | Ongoing participation; Discussion threads due: 9/19, 9/26, 10/24 | 25%  (5% for each of three discussion threads; 10% overall participation) |
| Presentations | 11/15, 12/6 | 50%  - Drug repurposing presentation, 10%  - Final presentation, 40% |
| Short Paper | 11/22 | 25% |

## Participation and discussion threads (25%)

### In Person

Students are expected to attend *and participate* in all classes. Each class will involve discussion in which you are expected to participate. While participation will not be tracked in each class, you will be given an overall score at the end of the course. Your engagement and participation are important not only for your own learning but also the learning of others. If for any reason you will not be in class, you should contact the course coordinator prior to class to alert them of the absence and make arrangements to make up course content. One excused absence is allowed during the course which will not affect the attendance grade. All absences require students to make up content which may include watching a recording or an assignment as assigned by the instructor.

In some cases or under extenuating circumstances, students may be permitted to attend class via Zoom (although it should be noted that the course is designed for in-person interaction). Please contact the Course Coordinator in advance for access to the Zoom link if you find yourself in a situation that precludes in-person attendance.

### Online

To extend the collaborative learning community online, you will be required to post your own and respond to others’ comments, thoughts, insights, or reflections with respect to the course videos, materials, and your own related experiences through online discussion threads on Canvas. Use this virtual space to connect with other classmates to help you think through the concepts we are learning in the course.

As everyone’s participation is essential in creating this virtual community, a minimum of 2 posts per designated discussion is required. One post must be created on your own, and the second must respond to a classmate. Beyond the 2-post minimum, you can create or comment as many times as you would like.

For the 2-post minimum, each post must be substantive, meaningful, and 200-400 words which may include:

* Interpretation of information or data from the video or materials provided in class or online;
* Experiences you have or points you would like to contribute based on your own understanding or your peers’ comments.

#### Due dates for online posts:

Posts should be completed by Tuesday of the week they’re due, in preparation for in-class discussion and debrief on Wednesday.

Tue, Sep 19 by 11:59pm – HIV

Tue, Sep 26 by 11:59pm – CRISPR/Cas

Tue, Oct 24 by 11:59pm – Rare Diseases

#### Discussion Thread Wrap-up

After the closure of a discussion thread, we will spend the first 10-15 minutes of the next class with a discussion about the thread which will help to bring the thread full circle so that your thoughts are put in context of the group's thoughts and any questions or issues can be addressed in a face-to-face manner.

## Presentations (50%)

A significant part of graduate education is learning how to research a topic, critically analyze your findings, and then disseminate your discoveries to an audience. There will be 2 presentations over the course of the semester, one on drug repurposing and another on a topic of your selection (details below).

### Presentation 1: Drug Repurposing Presentation

**Length**: Short (TBD based on number of students)

**Topic**: Drug repurposing

**Due date**: Wed, 11/15

**Weight**: 10% of grade

**Description**: “Drug repurposing” stands for situations where a medicine developed for treating a given disease is applied and effective to treat an apparently unrelated disease. Several medicines have followed that path, and students will be given some literature on that topic. Students’ presentations will focus on specifics of **one example** of the development of a repurposed molecule, either past or present, **or** a description of national or international coordinated efforts towards drug repurposing.

The presentations on examples of repurposing will cover

* the description of the medicine,
* the molecular target of the medicine,
* initial clues that led the researchers to the repurposing idea,
* the path followed to lead to registration of the medicine for the new application, and
* the impact on patients.

Grading will be based on the pertinence of the example, as well as clarity and accuracy. Students focusing their presentation on national/international efforts for repurposing will discuss the challenges and opportunities of these efforts and the potential societal impact.

### Presentation 2: Chosen Topic

**Length**: 15 min presentation, 5 min Q&A

**Topic**: Chosen by student

**Due date**: Wed, 12/6

**Weight**: 40% of grade

**Description**: Students are asked to share specifics on one area of the course that they feel inspired by. They could for instance describe how a new medicine against a specific rare disease was or is being developed, discuss the promise and shortcomings of Cancer Vaccine or cell therapy approaches, analyze what public health efforts could help development of a future pandemic virus vaccine or medicine, explore new areas of treatment enabled by CRISPR-Cas technology, discuss business application of a specific discovery, share thoughts/examples about drug pricing and societal aspects, etc.

Grading will be based on pertinence of the topic, depth and accuracy, as well as clarity.

## Short Paper (25%)

**Due**: Wed, 11/22

**Length:** 2 pages, single-spaced, with 1-inch margins

This 2-page paper will describe an effort in the area of precision medicine that students choose. Precision medicine is applied to many areas, from oncology to neurosciences, and students will integrate information they learnt from course presentations, e.g. gene/cell therapy and patient characterization-focused courses, to choose a new example or opportunity for precision medicine. They will discuss the following aspects:

* Describe the chosen therapeutic application of precision medicine and what it means to the patient
* Technological progress that has enabled this application of precision medicine
* Differences in the development path, regulatory aspects, need for diagnostic
* How this differs from the traditional treatment approach and what advantage it brings to the patient over traditional one-size-fits-all medicine
* What different approaches the treating physician needs to take
* The cost impact and impact on society

The restriction to 2 pages, single spaced with 1-inch margins, will require students to be concise and summarize their thoughts.

# Course Policies and Procedures

## Attendance:

Students are expected to attend and participate in all classes. If for any reason a student will not be in class, they should contact the Course Coordinator prior to class to alert them of the absence and make arrangements to make up course content. One excused absence is allowed during the course which will not affect the attendance grade. All absences require students to make up content.

## Academic Policies:

As a University of Pennsylvania student, you are required to uphold Penn’s [Code of Academic Integrity](https://provost.upenn.edu/policies/pennbook/2013/02/13/code-of-academic-integrity). Specifically, this means that materials that you submit either online or in person should be independent works created by you that uphold all tenets of academic integrity (i.e. do not cheat, fabricate, or plagiarize, amongst others). We encourage you to reach out to the course director or coordinator if you are not clear on what potential violations are.

## Canvas:

All course materials (ppts, announcements, lecture recordings) and assignments will be posted on Canvas. Contact the course coordinator with questions. [Log in](https://canvas.upenn.edu) with Pennkey at <https://canvas.upenn.edu> .

## Course Evaluations:

Course evaluations are completed in the BLUE system. These are a required part of course participation. An email from the BLUE team will be sent to students with a link and directions on how to complete the course evaluation(s).

## Student Disabilities Services:

The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the office of Student Disabilities Services (SDS). Please make an appointment to meet with me and the course coordinator as soon as possible in order to discuss your accommodations and your needs. If you have not yet contacted SDS, and would like to request accommodations or have questions, you can make an appointment by calling SDS at 215-573-9235 or accessing the [**MyWeingartenCenter**](https://urldefense.com/v3/__https:/upenn.us10.list-manage.com/track/click?u=6c89def14a1d88f5cb78518e7&id=22bdd97ae3&e=66d3273cbf__;!!IBzWLUs!TPk0vqHbPJWCqAbCO7VesoIOuzTIRx0XQlopbkilPnv5gR0wbSaeTXYnBN_6NAjVSIuRAaKPwFQXf2DnJwtfp5gVDFMNo7LhEQ2R$) portal. The office is located in the Weingarten Learning Resources Center at Hamilton Village, 220 S 40th St Suite 260. All services are confidential.

# Course Lecturer Bios

**Pankaj Agarwal, PhD,**

**Chief Computational Biologist, BioInfi**

Dr. Pankaj Agarwal has 23+ years of strategic and tactical experience utilizing bioinformatics to enable drug discovery and create pipeline value. He has collaborated extensively with numerous pharmaceutical project teams, academic/biotech partners, and top informatics talent. Dr. Agarwal has 50+ publications in top journals, including Nature Rev Drug Discovery, Nature Biotechnology, and Clinical Pharmacology & Therapeutics, as well as multiple patents. In 2016, he was among a group of select scientists appointed as senior fellows at GSK. Dr. Agarwal has also served on NSF, NIH, FDA and PhRMA panels. He possesses a B.Tech. in Computer Science & Engineering from IIT, Delhi and a Ph.D. in Computer Science from the Courant Institute of Mathematical Sciences at NYU. He is a founder and senior member of the International Society for Computational Biology (ISCB). Most importantly, Dr. Agarwal is passionate about drug discovery and helping patients.

**Letizia Amadini-Lane, PharmD**

**CEO & Founder of LAL Group**

LAL Group is a results-focused consulting firm providing development, coaching, and training to boost performance in leaders, boards, and organizations. Letizia is also creator of Visiva Leadership®, an

innovative and transformational experience that builds deeper self-awareness and strengthens personal

connections across leadership teams and boards.

Letizia has extensive experience in corporate development, business transformation, strategic alliance creation, and government relations, primarily in the life sciences. She was VP, Strategic Alliances for Sanford Burnham Prebys Medical Discovery Institute. Previously, she held multiple executive roles at

GlaxoSmithKline, including VP & Global Head of Employee Value Proposition, VP & Head of R&D Leadership Culture, and VP, Strategy, Operation and Alliance Management for Worldwide Business Development. Prior to joining GSK, she was an independent consultant in the cardiovascular therapeutic area for SmithKline Beecham, where she created a strategic alliances function. She was the principal of AXTEN-Health Corporation, an international case management, consulting and referral service. Prior to

AXTEN, she was pharmaceutical specialist for The World Bank.

Letizia holds a Doctor of Pharmacy from University of La Sapienza and Master of Herbal Medicine from University of Urbino. Her interest in the underlying drivers of business success led her to shift from

profit center leadership to organizational and leadership development, with further personal development and training in psychology.

**Claudine Bruck, PhD**

**Course Director, ITMAT, University of Pennsylvania and Chairman, Prolifagen**

Before her current roles, Dr. Bruck was Vice-President and Head, Ophthalmology Discovery Unit at GlaxoSmithKline from 2008 to 2015. Before that, Dr Bruck was a founding member and Vice-President of the Center of Excellence for External Drug Discovery (CEEDD) and part of the leadership team responsible for managing a diverse drug discovery portfolio of external research alliances. In the CEEDD, she helped design GSK’s initial externalization strategy and gained valuable business development experience. Before that she held various positions in the Biopharmaceutical and Vaccine R&D groups at GSK. Dr. Bruck has a PhD from University of Brussels. She was a post-doctoral student at Harvard University Medical School and an Assistant Professor at Tufts Medical School.

**Gary Dubin, MD**

**President, Global Vaccines Business Unit at Takeda**

Dr. Dubin has more than 28 years in vaccine research and development and has spent the last 25 years at Takeda GlaxoSmithKline (GSK) Bio (now GSK Vaccines) where, since 2010 he held the role of Vice President and Head, Global Late Clinical Development. During his career at GSK, he led global teams responsible for the clinical development and licensure of a broad range of vaccines addressing important unmet medical needs, including seasonal influenza (Fluarix Quadravalent and FluLaval Quadravalent), pandemic influenza (Pandemrix and Aprepandrix), meningococcal meningitis (Menhibrix and Nimenrix); human papilloma virus (Cervarix), rotavirus (Rotarix), strep pneumonia (Synflorix and protein-based vaccine in phase II development), malaria (RTS,S vaccine; submitted for licensure), herpes zoster (phase III); measles/mumps/rubella (US development program, phase III); tuberculosis (phase II), and others. He also supported Medical Affairs activities for these development programs and served as a core member of all major medical governance committees at GSK, including their Vaccines Medical Governance Board and the Vaccines Safety Board. Gary holds a Medical degree from the University of Pennsylvania and completed his Adult Internal Medicine residency training at the University of Colorado. He also completed a fellowship in Clinical Infectious Diseases and a postdoctoral research fellowship in Molecular Virology at the University of Pennsylvania. Prior to joining GSK, Gary served as Assistant Professor of Medicine in the Infectious Diseases Division at the University of Pennsylvania School of Medicine and currently serves as Adjunct Associate Professor of Medicine at the same institution. He holds numerous patents in the vaccine field and has co-authored more than 75 scientific publications.

**Amy Ebel, BS, PharmD**

**Senior Director, Global Strategic Labeling Head at GlaxoSmithKline**

Amy is a clinical pharmacist who has led the development and revision of prescriber and patient labeling for US and global markets for close to 15 years.  She has led labeling teams across the medication lifecycle from early drug development to the postmarketing setting for over 50 GSK products and across numerous therapeutic areas including anti-infectives, cardiovascular, diabetes, hematology/oncology, respiratory, and vaccines.  Prior to working in Regulatory Affairs, she held previous positions within Medical Information at GSK and has published papers on both Regulatory and Medical Information topics, including most recently, a review of compliance with the Physicians Labeling Rule (new prescribing information format and content regulations).  She has been a member of the FDA/Brookings Institute Patient Medication Information initiative for over 2 years – a working group established to improve patient medication information communications. Amy obtained her B.S. in Pharmacy at Oregon State University, her PharmD at the University of Utah, and completed a Specialized Residency in Drug Information at Oregon Health Sciences University. Before joining GSK, she trained or worked in retail, ambulatory care, and inpatient pharmacy settings, and continues to utilize these varied pharmacy experiences to advance improvements in clear and effective labeling communications for healthcare prescribers and patients.

**Meredith Hans Moore, PhD**

**Vice President, Compound Development Team Leader at Janssen**

Meredith is responsible for all research & development and life cycle management activities for TREMFYA across multiple disease areas and indications. This role is accountable for delivering the asset development strategy and execution and leading a high performing cross functional team. Prior Meredith was the Senior Director Portfolio Strategy Implementation for the Immunology therapeutic area, where she worked closely with the leadership team to drive the execution of an end-to-end TA portfolio strategy. Meredith joined Janssen in 2015 as a Program Management Leader for the STELARA® (ustekinumab) compound development team. Before joining Janssen Meredith has also worked in the MedTech sector, where she held roles of increasing responsibility in R&D and Medical Affairs, primarily focused on combination devices and cell-based therapies.  Meredith joined Johnson & Johnson in 2012 via the Synthes acquisition. Meredith received her Ph.D. from Drexel University in Chemical Engineering where her work focused on long-term drug delivery technologies

**Karen Kozarsky, PhD**

**Founder & Chief Scientific Officer at SwanBio Therapeutics**

Karen is the founder and CSO of SwanBio Therapeutics, a gene therapy company active in rare diseases. Dr. Kozarsky previously served as Vice President of Research and Development at REGENX Biosciences, LLC (now REGENXBIO Inc.) where she was responsible for R&D strategy and execution. Dr. Kozarsky has over 15 years of experience in research and development in the pharmaceutical industry. She headed and helped found the Gene Therapy group in the Biopharmaceuticals R&D Unit at GlaxoSmithKline and was a Research Assistant Professor at the University of Pennsylvania in the Institute for Human Gene Therapy. Dr. Kozarsky received a PhD in Biology from the Massachusetts Institute of Technology and a B.A. in Biology from Amherst College.

**Lawson MacArtney, DVM, PhD, FRCPath**

**CEO, Scout Bio Inc**

Dr. MacArtney served as the Chief Executive Officer and President of Ambrx, Inc. from January 2013 to June 2015. He was Senior Vice President of Emerging Business Unit at Shire plc (Shire AG) since February 2011 and was accountable for discovery initiatives through Phase III development of Shire’s Specialty Pharmaceutical portfolio. He was successful in expanding and diversifying the pipeline of the Specialty Division through in-house discovery and extensive partnering activities. He spent nearly 20 years working with GlaxoSmithKline (GSK) from 1999 to 2011, where he served as Senior Vice President of Global Product Strategy and Project/Portfolio Management from 2007 to 2011, Senior Vice President, Cardiovascular and Metabolic Medicine Development Center from 2004 to 2007, and as Vice President, Global Head of Cardiovascular, Metabolic and Urology Therapeutic Areas from 1999 to 2004. Throughout his time at GSK, Dr. MacArtney held leadership roles in the Cardiopulmonary Therapeutic Area, from Project Leader to Global Head for Cardiovascular, Metabolic and Urology. His role is currently CEO, Scout Bio Inc. He has been the Chairman of Viking Therapeutics, Inc. since June 4, 2015 and serves as a Director of Viking Therapeutics, Inc since May 2014. He served as a Director of Ambrx, Inc. since January 7, 2013 until June 2015. He served as Executive Director, Commercial Operations at AstraMerck, Inc. He worked at AstraMerck and Astra Pharmaceuticals in leadership roles in operations, marketing, sales, and customer service. He has global drug development and commercialization experience. Dr. MacArtney is trained as a veterinarian and in diagnostic pathology. He is a Fellow of the Royal College of Pathologists. He holds B.V.M.S. (equivalent to a D.V.M.) from Glasgow University Veterinary School. Dr. MacArtney received his PhD from Glasgow University Veterinary School in Scotland where he was a Royal Society Research Fellow.

**Brian MacDonald, MB, ChB, PhD**

**Senior Advisor and Director, Disc Medicine**

Dr. McDonald is a physician scientist with over 20 years of experience in biopharmaceutical drug development. Before his current role, he was the Founding CEO of Dodeca Therapeutics. Before that, he was CEO of Merganser, guiding the company through its seed financing stage and Series A financing. He is an experienced biotech executive with extensive R&D experience. Before founding Merganser in 2011 Brian was CEO of Zelos Therapeutics and previously worked in senior management roles at Tetralogic Pharmaceuticals and 3-Dimensional Pharmaceuticals and as Group Director of Clinical R&D at SmithKline Beecham (subsequently GlaxoSmithKline). He received his medical degree and a PhD in musculoskeletal cell biology from the University of Sheffield, UK and trained as a rheumatologist at the Royal National Hospital for Rheumatic Diseases in Bath, UK.

**Bruno Marques, PhD**

**Head, Process & Product Development, Century Therapeutics**

Bruno Marques leads the Process & Product Development team at Century Therapeutics, with a focus on genetically engineered, universal iPSC-derived immune effector cell products (NK, T cells) to target hematologic and solid tumor cancers. Prior to Century, Bruno spent 14 years developing and commercializing biopharmaceutical products at Merck and GlaxoSmithKline, while directing biotechnology industry-related courses at Rutgers University. At GSK, Bruno held leadership roles in process development and portfolio management, contributing to the launch of drugs such as Nucala (mepolizumab). He eventually joined GSK’s Cell & Gene Therapy platform as Director of Manufacturing Strategy in support of autologous immunotherapies. Bruno is a Chemical Engineer by training, with a PhD from Carnegie Mellon University and a BS from the Illinois Institute of Technology.

**Medha Kapil, JD**

**former Head of Legal and Corporate Development at BioMotiv**

Medha Kapil is a business executive and lawyer with experience in business/corporate development, early-stage investment in the life sciences sector and all aspects of related legal transactions in that space.  She has experience with forming and growing early-stage biotech companies and a passion for all things start-up, innovative and entrepreneurial. She served as the Head of Legal and Corporate Development at BioMotiv, a life sciences accelerator/fund that operates in the translation space - they license-in early-stage technologies from research institutions and then spin-out and operate the companies virtually.  Medha joined BioMotiv in its early stages, helped them scale-up the platform and operations to a team of 60+.  She has since transitioned out and is searching for her next adventure in the start-up/innovation ecosystem.  Medha holds a Bachelor’s Degree in Accounting and Finance from Elmhurst College and a JD from Case Western Reserve University School of Law.

**Carlo Russo, MD**

**Chief Medical Officer, Genenta Science**

Dr. Russo serves as Chief Medical Officer for Genenta, an Italian gene therapy company. Before that , he was Chief Medical Officer and Executive Vice President of Avalanche Biotechnologies, Inc. and before that, he was Chief Medical Officer and Head of Development at Annapurna Therapeutics SAS. Prior to joining Annapurna, he served as a Senior Vice President in various R&D capacities at GSK, including as head of Development of the Biopharm Unit and as head of R&D of the Rare Diseases Unit. Under his leadership, GSK filed Market Authorization Application (MAA) in Europe for gene therapy treatment of severe combined immunodeficiency syndrome (ADA-SCID) patients. He served as the President and Chief Executive Officer of VaxInnate Corporation. He has been a leading expert in immunology and vaccine development for over 20 years. Prior to VaxInnate Corporation, he served as Executive Director and head of the Global Strategic Regulatory Development of Merck Research Laboratories. Dr. Russo oversaw the development of innovative vaccines including vaccines against Human Immunodeficiency Virus (HIV), Human Papilloma Virus (HPV), Rotavirus and combination pediatric vaccines of Merck Research Laboratories. He has held academic appointments at Cornell and is an author on 72 research papers.

**Yolanda Sanchez, PhD**

**Scientific Consultant and Expert in Residence, Pharma and Biotech**

Yolanda has 25+ years of combined academic and industry experience in translational research and drug discovery, including 14 years at GSK where she was Vice-President and Discovery Performance Unit Head (Respiratory Therapy Area), responsible for a portfolio of mechanisms to address disease progression in chronic respiratory diseases. Her group at GSK focused on cellular stress responses and mechanisms of repair and remodeling in lung disease, using genetics, functional genomics and other ‘omics approaches to identify, validate and progress to the clinic several novel drug targets. Yolanda’s expertise spans target/pathway identification and validation, lead optimization, clinical candidate selection, translational studies, biomarkers, and early clinical studies, with an established track record of delivering innovative approaches to enable the discovery and progression of novel clinical candidate molecules. She has managed numerous academia-industry collaborations and published in high quality journals (Science, Journal of Clinical Investigation, Journal of Cell Biology, American Journal of Respiratory and Critical Care Medicine, Journal of Immunology). Yolanda obtained her PhD at the University of Oviedo (Spain) and did her postdoc at the National Institutes of Health (Bethesda, MD).

**Jeremy Waight, PhD**

**Scientific Director ImmunoOncology Research Unit, GSK**

PhD-trained immunologist with >10 years of industry-related experience in the field of cancer immunotherapy. A background in innate and adaptive immunity, associated immune checkpoints, and FcgR biology. Jeremy has been with GSK since 2019, where he leads the biology for several development programs (including the CD226 axis programs – CD96, PVRIG, and TIGIT), as well as modality-agonistic target discovery/validation for the IOC RU. Prior to GSK, spent time at Merck KGaA and Agenus, leading multiple cancer immunotherapy programs from discovery and validation to early clinical studies.