

AstraZeneca 

 MedImmune

# Partnering for scientific leadership



AstraZeneca is a global, science-led biopharmaceutical company that focuses on the discovery, development and commercialisation of prescription medicines, primarily for the treatment of diseases in three main therapy areas – Oncology, Cardiovascular, Renal & Metabolism, and Respiratory. We are also selectively active in the areas of Autoimmunity, Neuroscience and Infection.

AstraZeneca operates in over 100 countries and its innovative medicines are used by millions of patients worldwide. Our three strategic R&D sites are located close to globally recognised bioscience clusters, making it easier to access world-class talent and opportunities for collaboration and partnerships.

For more information on partnering with us, please visit: [www.astrazeneca.com/partnering](http://www.astrazeneca.com/partnering)



“As a science-led organisation, we trust in the potential of ideas and pursue them, alone and with others, until we have transformed the treatment of disease.”

Pascal Soriot, Chief Executive Officer

### A global business co-located around three strategic R&D centres

**100+**  
countries

**61,100**  
employees



**250**

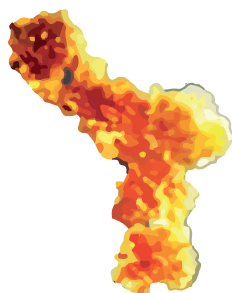
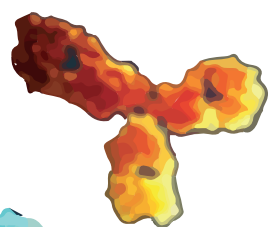
major or strategically important business development transactions over the past three years

**Over 600**

relationships globally to access the best science to stimulate innovation and accelerate the delivery of new medicines to target unmet medical need

# Pushing the boundaries of science to deliver life-changing medicines

Distinctive science supported by excellence in development and commercialisation are at the core of our commitment to deliver medicines that can transform the lives of patients around the world.



Antibody that binds to upstream epithelial cytokines to prevent a range of inflammatory responses.



Our expertise spans the entire life-cycle of a medicine. We have a rare combination of discovery and development capabilities across small molecules and biologics, immunotherapies, protein engineering technologies and delivery devices. These are reinforced by a strong focus on translational science and precision medicine.

Our extensive therapy area knowledge is combined with a deep understanding of the needs of patients and doctors, as well as healthcare providers, payers and regulators.

We know that innovation doesn't happen in isolation, so we partner with others around the world, including academia, governments, industry and scientific organisations to access the best science and commercial expertise, and contribute complementary technologies, molecules and know-how.

We tailor deals that are structured to drive real progress from bench to bedside. From early-stage research collaborations through to late-stage development and global commercialisation transactions, our aim is to create partnerships that are founded on trust and transparency, and that best achieve our mutual goals.

“Collaboration is a vital component in the discovery, development and delivery of the next generation of life-saving medicines. Working with partners to access cutting-edge science or leading commercial capabilities that complement our own distinctive expertise is an important part of our strategy.”

**Mene Pangalos**, Executive Vice-President,  
IMED Biotech Unit and Global Business Development

## Our evaluation criteria

We assess all projects against our “5Rs” evaluation criteria to ensure we take forward the most attractive opportunities, regardless of source. The ‘R’ stands for ‘right’ – determining the right therapeutic target, designing the drug to reach the right tissue, selecting the right patients, achieving the right level of safety, and determining the right commercial potential.

These criteria also provide a framework for consistent and objective feedback to our partners, whether we decide to move forward with the opportunity, or not.

# Partnering with us

We partner with like-minded science-led organisations that share an unrelenting focus on scientific quality, smart risk-taking and good decision-making.

We bring a distinctive combination of skills and resources to every partnership.

Our decision-making is driven by deep patient, regulatory, payer and physician insight. We have strong regulatory and medical affairs capabilities that inform our work to bring new treatments to patients. Our dedicated teams ensure physician and payer considerations are embedded early in our R&D decision-making, providing informed, evidence-based perspectives on clinical and economic impact.

We design studies that allow the impact and value of our molecules to be evaluated in clinical and real-world settings. This ensures that healthcare decision-makers have the information they need

to assess the positive impact of our medicines on health outcomes and make the best treatment choices for their patients.

We have a commercial presence in over 100 countries, including strong research and operational capabilities in Japan and emerging markets such as China and Russia. By combining our therapy area expertise with local knowledge, we can develop, register and commercialise medicines that best meet local patient needs.

We have a firm commitment to developing medicines suited to the needs of individual patients. We explore partnerships that reinforce our precision medicine strategy with biomarker and diagnostic technologies, and that drive smarter clinical trials.

We are interested in pursuing a range of value-enhancing business development opportunities that have a clear strategic fit with our portfolio and commercial capabilities.

- > **Research collaborations, consortia and partnerships:** Conducting early-stage research with the best researchers from academia and biotech from across the globe. For example, AstraZeneca scientists are working side-by-side with Cancer Research UK and Medical Research Council-supported researchers at a joint UK Centre for Lead Discovery in Cambridge, identifying new methods to better understand a range of diseases and potential treatment options.
- > **Peer collaborations:** Maximising pipeline assets and complementary expertise to create value for patients. For example, we have a number of clinical trials underway working with partners to explore novel combinations of immuno-oncology assets. These partnerships allow us to test the potential of novel combinations, with the aim of improving the depth and duration of response for cancer patients.
- > **Precision Medicine collaborations:** Our commitment to precision medicine includes partnerships to deliver targeted therapies and companion diagnostics to markets around the world. For example, in December 2016 we entered into an agreement with Foundation Medicine Inc. to develop next generation sequencing (NGS), a comprehensive genomic profiling assay for all solid tumours incorporating multiple companion diagnostics. This first-of-its-kind test for individuals with advanced cancer was approved by the FDA in March 2018 and is intended to identify patients who may benefit from targeted therapies, including osimertinib.

Over the past three years we have completed more than **250** strategically important business development transactions, including some **54** in 2017. Of these transactions:

- > **17** were related to pre-clinical assets or programmes
- > **9** to precision medicine and biomarkers
- > **20** transactions helped expand our biologics capabilities

- > **In-licensing and acquisitions:** Pursuing partnering, in-licensing and acquisitions to strengthen our main therapy area portfolios. For example, in December 2015 we acquired a majority stake in Acerta Pharma, giving us access to an irreversible small molecule oral BTK inhibitor, which has the potential to transform the treatment landscape for B-cell malignancies.
- > **Externalisation:** These agreements fall broadly into two categories:
  - Collaborations aimed at maximising the potential of key assets in our pipeline, by accessing therapy area expertise that falls outside our main areas of focus. For example, in July 2017 we entered into a global strategic oncology collaboration with Merck to co-develop and co-commercialise our first-in-class oral poly ADP ribose polymerase (PARP) inhibitor, olaparib, for multiple cancer types and to jointly develop and commercialise selumetinib, an oral, potent, selective inhibitor of MEK, part of the mitogen-activated protein kinase (MAPK) pathway.
  - Those that aim to extend the commercial reach of our medicines through a partner's dedicated focus. For example, in March 2017 we entered into a strategic collaboration with Circassia Pharmaceuticals for the development and commercialisation of acclidinium bromide and acclidinium bromide / formoterol in the US. By working with an established respiratory biopharmaceutical company, we are able to support their commercialisation in the US for the potential benefit of millions of COPD patients, while further sharpening our focus on our respiratory development programmes.

- > **Divestment:** Out-licensing and divestment of medicines that sit outside our main therapy areas and mature brands that can be deployed better by a partner. These agreements allow us to redirect investment and resource to our main areas of focus while ensuring continued or expanded patient access. For example, in June 2017 we entered into an agreement with Grünenthal for the global rights to zolmitriptan outside Japan, supporting a sharper focus on our three main therapy areas while taking advantage of Grünenthal's expertise and dedicated focus to maximise the reach of this important medicine.

# An integrated approach



From pre-clinical research collaborations through to late-stage development and commercialisation deals, our partnering strategy focuses on innovative scientific capabilities and value-enhancing opportunities across our main therapy areas.

Our business development and partnering teams are embedded within our business units. This allows us to combine our scientific and commercial insight with our business development expertise to create the right partnerships that offer greatest value for us, for our partners and for patients.

## Early-stage partnering

Designed to improve innovation and accelerate decision-making, we have created autonomous biotech units for our small molecule and biologics research: IMED (Innovative Medicines and Early Development) and MedImmune. These research units are focused on pioneering science that will have a transformational impact on health outcomes for patients.

Our early-stage partnering teams, Scientific Partnering & Alliances within IMED and Partnering & Strategy within MedImmune, are focused on opportunities up to and including Phase I that are a strategic fit with our therapy area portfolios and innovative scientific capabilities.

## Mid- to late-stage and commercial partnering

Our therapy area-specific Search & Evaluation teams are focused on maximising the value of our mid-to-late-stage portfolio across small molecules and biologics. They work closely with our dedicated deal-making and corporate development centres of excellence.

Our Business Development Operations team works with partners from due diligence, precision medicine, and creative dealmaking through to alliance management.

Our Corporate Development team sets the long-term direction of the company to maintain our financial and commercial competitiveness.

## Our team

### Early-stage (up to and including Phase I) across our biotech units

**Innovative Medicines and Early Development (IMED)**  
Scientific Partnering & Alliances  
Small molecules and new modalities

**MedImmune**  
Biotech Partnering & Strategy  
Biologics

Our biotech partnering teams are focused on opportunities that are a strategic fit with our therapy areas and innovative scientific capabilities.

### Mid- to late-stage and commercial

#### Search & Evaluation

Specialist Search & Evaluation teams are aligned to our main therapy areas (Oncology, Cardiovascular, Renal & Metabolism, and Respiratory) across small molecules and biologics.

#### Business Development Operations

Business Development Operations provides world-class capabilities in due diligence and creative deal-making, including precision medicine and alliance and integration management across therapeutic areas.

#### Corporate Development

Corporate Development sets the long-term direction of the company to maintain our financial and commercial competitiveness, including transformational M&A, global opportunities in new areas of business and geographic opportunities in key markets or regions.

# Maximising value through successful partnerships

We are committed to creating strong, long-term partnerships that help speed the delivery of innovative and life changing medicines to the people who need them. We are also committed to ensuring both parties are receiving the greatest possible value from the relationship.

Our Alliance & Integration Management team is engaged from the outset and throughout the deal process. Gaining an early understanding of the strategic, operational and cultural fit between us and our partners helps us structure the partnership governance to be as effective as possible right from the start. It also helps to build trust and transparency, forging a strong relationship at all levels.

- > A dedicated member of the Alliance & Integration Management team is assigned early in the evaluation stage and remains the key contact point for the partner throughout the collaboration.
- > Our Alliance & Integration Management team is made up of a group of highly experienced professionals who have been drawn from different backgrounds across our pharmaceutical business providing the optimal skill-set to any individual collaboration.
- > Based on our work across a wide range of complex business and scientific collaborations, we have developed industry-leading processes and tools that ensure smooth and efficient interactions.
- > Our Alliance & Integration Management team leverages a company-wide network; in acquisitions and divestments, they act as the central hub for the key functional areas across the business ensuring an efficient integration or transition of the products involved.

> We monitor, assess and learn from the performance of our partnerships, seeking honest feedback from our partners throughout the relationship.

Externalisation is a core component of our strategy and has an important role to play in the delivery of our ambition, as we continue to sharpen our focus on progressing key assets within our main therapy areas. It allows us to access scientific or commercial capabilities in areas outside our priorities and expertise.

As with all other agreements, signing the contract is just the first step in the path to maximising the value from the deal. The smooth and efficient transfer of the medicine(s) is essential for both partners and, most importantly, for the patients it serves.

Externalisation can be done to great effect through collaborative partnerships. Strong alliance management is vital in creating these relationships and in delivering the asset(s) to the partner with minimal impact and disruption.

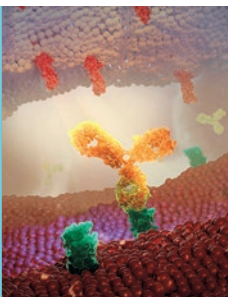
At AstraZeneca, our Alliance & Integration Management team is highly experienced at managing externalisation transactions to ensure a smooth process for all parties. We leverage the support of dedicated functional experts across the business, from regulatory and pharmacovigilance through to manufacturing. Within manufacturing, we have launched a dedicated organisation, '3PS', to coordinate the supply of medicines to our partners, operating as a contract manufacturing organisation.



# Our areas of interest

Across our biologics and small molecule research, we concentrate our scientific efforts and the weight of our investment, including in business development, on three main therapy areas:

## Oncology



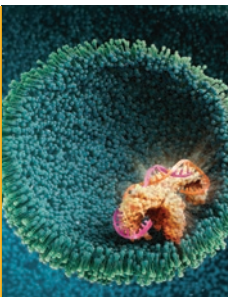
Alongside this, we have an opportunity-driven approach to **Autoimmunity, Neuroscience** and **Infection** to create value from our science for patients.

## Cardiovascular, Renal & Metabolism



We explore **precision medicine** partnerships that reinforce our personalised healthcare strategy and collaborations to access cutting-edge **technology**.

## Respiratory



# Oncology

AstraZeneca has a deep-rooted heritage in oncology. Our ambition is to eliminate cancer as a cause of death through scientific discovery and collaborations.

We believe that the challenge of beating cancer can be met through the development of novel, first- and best-in-class therapeutics in the fields of molecular targeted therapies and cancer immunotherapy that specifically target the underlying biological mechanisms of the disease or how it evades effective immune response.

Our goal is to understand these mechanisms and develop treatment options that significantly improve patient survival rates and quality of life through a more complete tumour response, suppression of tumour growth and delayed or reduced tumour recurrence.

Our broad pipeline of small molecule and biologic therapies addresses multiple disease pathways and allows for combination therapies to increase the benefit to patients. Our pipeline of next generation medicines targets multiple diseases, in both haematological malignancies and solid tumours, through four key scientific platforms:

- > Immunotherapy
- > Tumour drivers and resistance mechanisms
- > DNA damage response
- > Antibody-drug conjugates

Antibody that blocks inhibitory signals from the tumour to cells of the immune system resulting in enhanced anti-tumour immunity.

In addition to our core capabilities, we pursue innovative partnerships that can accelerate the delivery of our strategy. For example, our multiple partnerships around novel combinations and recent investment in Acerta Pharma provides us with a potential medicine that could transform treatment for patients across a range of blood cancers, as well as clinical expertise in this complex area of medicine.

### Our partners include

- |                            |                              |
|----------------------------|------------------------------|
| > Advaxis                  | > Juno Therapeutics          |
| > Cancer Research UK       | > Kyowa Hakko Kirin          |
| > Celgene                  | > Lyzz Capital               |
| > Dical Pharmaceuticals    | > MSD                        |
| > Dong-A ST                | > Moderna                    |
| > Eli Lilly and Company    | > Mirati Therapeutics        |
| > Foundation Medicine      | > NewLink Genetics           |
| > G1 Therapeutics          | > Peregrine                  |
| > Heptares                 | > RedX Oncology              |
| > Horizon Discovery        | > SDIC                       |
| > Hutchison Medi<br>Pharma | > Star Pharma Pty Ltd.       |
| > Incyte                   | > Syndax<br>Pharmaceuticals  |
| > Inovio                   | > TerSera                    |
| > Innate Pharma            | > University of<br>Cambridge |
| > Immunocore               | > Vyriad                     |
| > Ionis                    |                              |
| > Janssen                  |                              |

# Cardiovascular, Renal & Metabolism (CVRM)

Our patient-led strategy is focused on addressing the multiple risk factors facing cardiovascular, metabolic and chronic kidney disease patients. Our goal is to reduce morbidity, mortality and organ damage through life-changing medicines.

This approach means we look at the CVRM patient as a whole, rather than by disease area, because we know that cardiovascular disease is a well-known consequence of diabetes and chronic kidney disease. Our aim is to unlock the scientific potential of our CVRM therapy area by investigating disease causes and progression, to provide next-generation treatments that can stop or even reverse disease progression.

## Main areas of interest

Dyslipidaemia, chronic heart disease and acute coronary syndrome

Heart failure and cardiac regeneration

Diabetes, NASH (non-alcoholic steatohepatitis) and obesity

Chronic kidney disease, including diabetic nephropathy

## Our partners include

- |  |  |
|--|--|
| > Astellas   | > Karolinska Institute                         |
| > APT Therapeutics   | > Max Planck Institute of Molecular Physiology |
| > Bicycle Therapeutics   | > Mitsubishi Tanabe Pharma Cooperation         |
| > Evotec   | > Moderna                                      |
| > Fundação de Amparo à Pesquisa do Estado de São Paulo & University of São Paulo | > Recordati                                    |
| > FibroGen   | > Shionogi                                     |
| > Harvard Stem Cell Institute  | > University of California, San Francisco      |
| > Ionis  | > University of Maryland                       |
| > Joslin Diabetes Center   | > University of Michigan                       |

Pancreatic beta cells at different stages of regeneration: AstraZeneca is investing in research that could stimulate the regeneration of beta cells in the pancreas with the aim of stopping the progression of, or reversing, the course of diabetes.

# Respiratory

We are building on our 40-year heritage to transform the treatment of respiratory disease with our growing portfolio of medicines.

Our work focuses on transforming the treatment of asthma and chronic obstructive pulmonary disease (COPD) in three areas:

- > inhaled combinations at the core of care
- > biologic medicines for the unmet needs of specific patient populations
- > scientific advancements where our ambition is to achieve disease modification and durable remission.

We have considerable capabilities in inhalation technologies, which span both pressurised metered-dose inhalers (pMDIs) and dry powder inhalers (DPIs), as well as our innovative Co-Suspension™ Delivery Technology.

We also have selective interest in other lung diseases such as Idiopathic Pulmonary Fibrosis (IPF), Cystic Fibrosis (CF) and Chronic Cough.

AstraZeneca is developing a TLR-9 receptor agonist (shown here) aimed at producing long-term benefit in asthma by addressing imbalances in the immune system that may be an underlying cause of the disease.

In our early development pipeline, we focus our research on three key areas: lung immunity, lung epithelium and lung regeneration.

## Our partners include

- |                        |                           |
|------------------------|---------------------------|
| > Allergan             | > Imperial College London |
| > Almirall             | > Insmed                  |
| > Amgen                | > Ironwood                |
| > Avillion             | > Pieris                  |
| > Bicycle Therapeutics | > Takeda                  |
| > Circassia            | > Valeant                 |
| > Dainippon Sumitomo   | > WuXi App Tec            |
| > Dynavax              |                           |

# Opportunistic focus

Our opportunity-driven approach to autoimmunity, neuroscience and infection seeks to maximise the value of our pipeline and portfolio through licensing and collaboration.

## Autoimmunity

We are strengthening our pipeline and improving treatment options and clinical outcomes for patients with inflammatory and autoimmune diseases. As common molecular pathways are often shared across multiple autoimmune diseases, this provides opportunities to identify and work with approaches that could become treatments for more than one disease.

### Areas of interest

- > Systemic lupus erythematosus (SLE)
- > Neuromyelitis optica spectrum disorder (NMOSD)
- > Psoriasis
- > Gout

## Infection

Our focus in infection is on respiratory viruses (influenza and respiratory syncytial virus), serious bacterial infections and selected chronic infectious diseases. We are actively working to better understand the role and potential of the human microbiome in determining the response to therapeutic intervention across multiple disease states.

### Our partners include

- > AbbVie
- > AIMM Therapeutics
- > Allergan
- > Daiichi Sankyo
- > Entasis Therapeutics
- > Green Cross Corporation
- > Humabs BioMed
- > Immune Design Corporation
- > Sanofi-Pasteur

## Neuroscience

With a long history in specific aspects of neurodegenerative diseases, analgesia and psychiatry, we continue to push the boundaries of science in areas of neurology (Alzheimer's and Parkinson's disease) and pain control.

### Our partners include

- > Daiichi Sankyo
- > Eli Lilly and Company
- > Karolinska Institute
- > Kyowa Kirin
- > Takeda
- > University of Cambridge

Nanoparticles circulating in blood stream

# Precision Medicine and Genomics

Precision Medicine is at the heart of AstraZeneca's approach to discovering and developing medicines. More than 90 percent of our pipeline follows a precision medicine approach.

Our bold ambition is to transform patients' lives by ensuring that innovative treatments are matched to those patients who are likely to benefit most – the right drug for the right patient at the right time. This is good for patients, payers and healthcare systems.

We are not a diagnostics company, so we look outside to access the best science and technology to support the development and commercialisation of our targeted medicines.

Our dedicated teams look to collaborate with a wide range of experts to identify, validate, and develop diagnostics to regulatory standards globally, and commercialise innovative biomarker capabilities intended for patient selection, disease identification, pharmacological assessment and drug response monitoring.

### Our Precision Medicine partners include

- > Abbott Diagnostics
- > Dako (Agilent)
- > Foundation Medicine
- > Guardant Health
- > Illumina
- > Myriad
- > Roche Molecular Systems
- > Roche Tissue Diagnostics (Ventana)
- > Thermo Fisher
- > Qiagen

# Technology

We are interested in cutting-edge technologies to enhance the quality, effectiveness and productivity of our research and translational capabilities.

### Our Technology partners include

- > Emulate
- > Genomics England
- > Human Longevity
- > Innovative Genomics Initiative
- > Labcyte
- > Tetragenics
- > Wellcome Trust Sanger Institute
- > Whithead Institute

### Areas of interest

- > Target validation tools and technologies
- > Novel HTS/lead generation approaches
- > Novel chemical libraries with evidence of biological relevance
- > Predictive safety and predictive efficacy platforms
- > Drug delivery platforms and medical device technologies
- > Novel delivery, manufacturing and analytical processes
- > New systems for drug targeting
- > Stem cell biology
- > Novel technologies for antibodies and vaccines
- > Application of artificial intelligence to drug discovery and development
- > Point-of-care testing
- > Monitoring devices
- > CRISPR

# What our partners say



“We are committed to contributing to human health and well-being world-wide, and in AstraZeneca we find a good partner that shares our philosophy, values and expertise.”

**Nobuo Hanai**, President and Chief Executive Officer, Kyowa Hakko Kirin

“Partnering with AstraZeneca in one of the largest strategic oncology collaborations in the industry has allowed us to be a leader in bringing new oncology treatments to patients. Further, it has been a pleasure to work with a company who equally values the importance of building the collaborative mindset & culture through its alliance processes.”

**Sunil Patel**, Senior VP, Business Development, Corporate Development, Merck & Co., Inc.

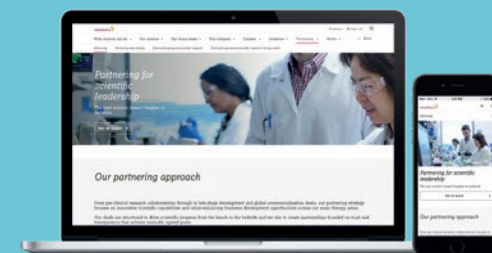
“AstraZeneca’s global network of professionals, skilled in transitioning products, are enabling the smooth transition of Imdur and contributing to TopRidge Pharma’s capabilities.”

**Dr Huaizheng Peng**, Non-Executive Director, China Medical Systems Holdings Ltd. and Director, TopRidge Pharma Ltd.



## Get in touch

You can find our contact details on the enclosed card, or by visiting [www.astrazeneca.com/partnering](http://www.astrazeneca.com/partnering)



For more information, please visit  
[www.astrazeneca.com/partnering](http://www.astrazeneca.com/partnering)

