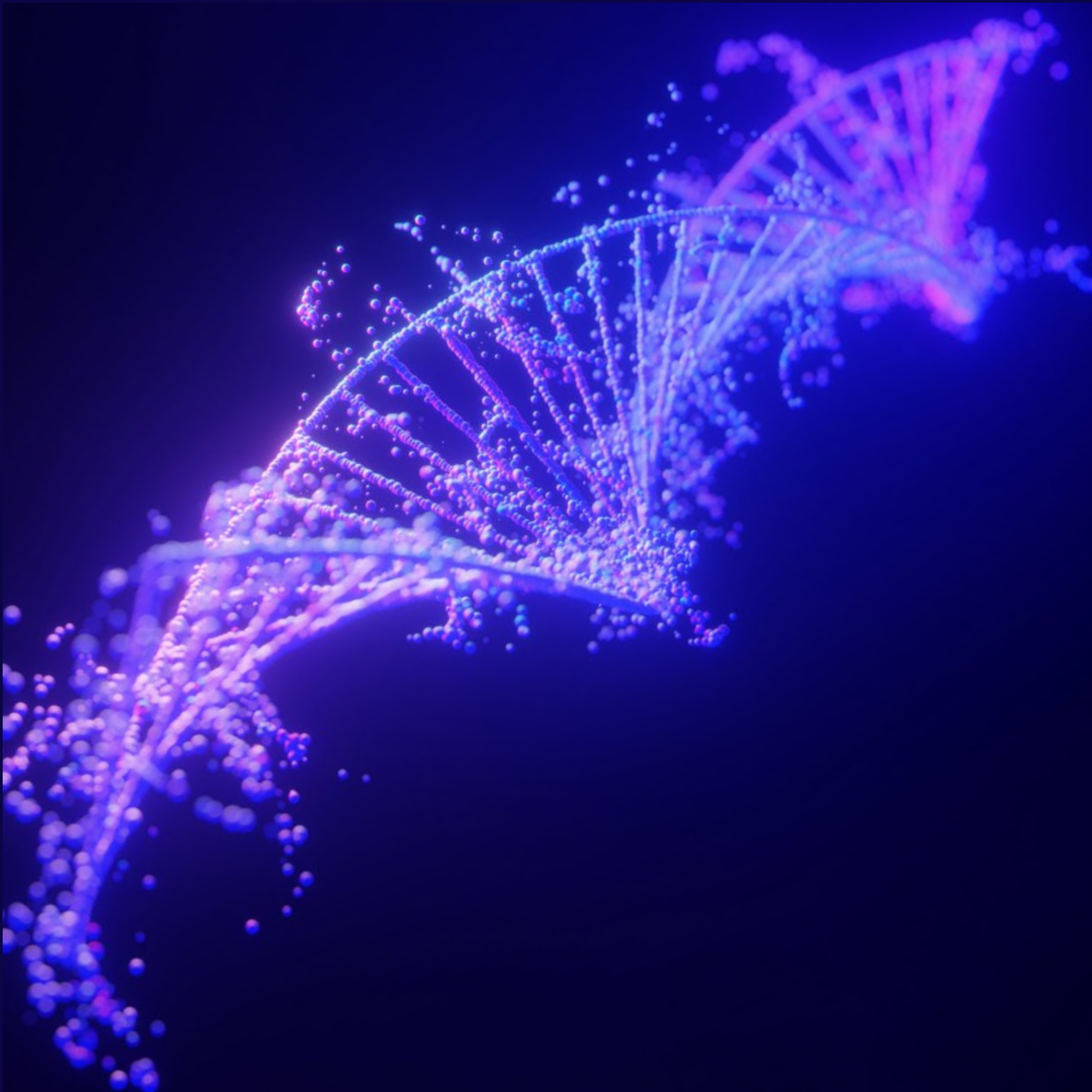


Baillie Gifford™

Health Innovation

Philosophy and Process



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Introduction to Health Innovation

From treatment to prevention

Baillie Gifford's Health Innovation Team believes that society is on the cusp of a revolution in terms of our understanding of human biology, and our approach to health and wellbeing. It is now time to redefine healthcare, to shift drug development away from trial and error to being data-driven, from one-size-fits-all medicine to personalised therapies, and ultimately from treatment to prevention.



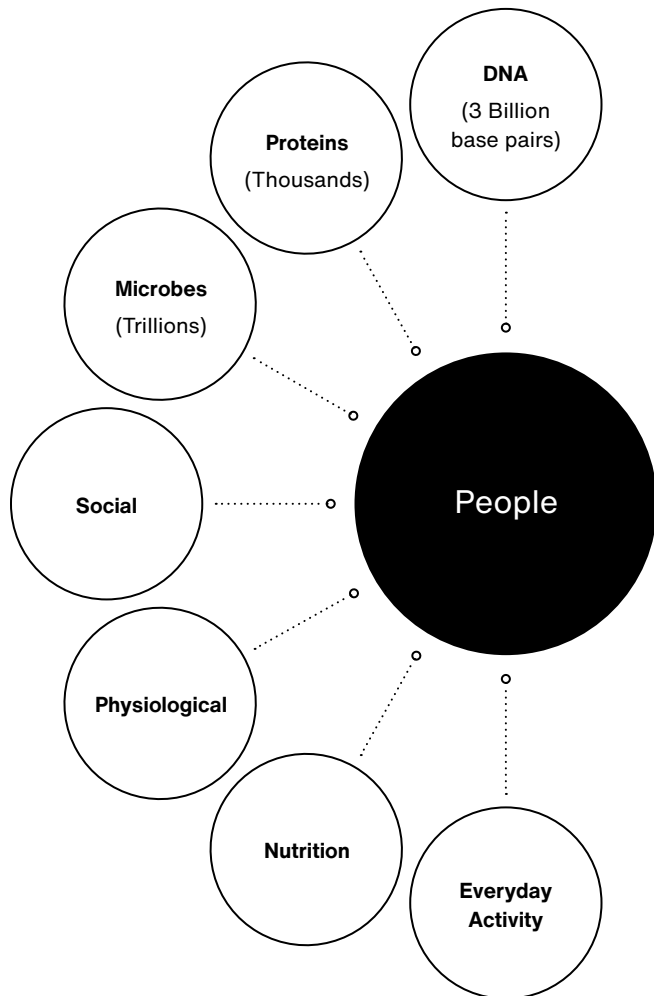
Why is now the time to invest in healthcare?

From a health perspective, humans have come a long way. If we were to condense our relatively short 200,000-year history into a single year, then most of the medical progress has occurred in the past four hours.

During this time we have seen incredible improvements in human life expectancy thanks to our efforts in reducing infant mortality and managing infectious diseases. However, over the final hour, innovation has ramped up dramatically. Not only are millennia of cumulative knowledge now bearing fruits, but an unprecedented level of convergence and collaboration between various fields of science and technology is pushing the boundaries of what is possible. This era of great convergence will transform life science. The future of healthcare is likely to be fundamentally different from what we have today.

Human biology is essentially the problem of large numbers. Each of us comprises around three billion DNA base pairs, is home to thousands of proteins, and hosts trillions of bacteria – all of which play a crucial role in our health. Until now, we simply have not had the means to collect and process these complex and sizeable data sets that pertain to our health. However, the convergence of genomics and information technology, together with advances in imaging, cloud computing, artificial intelligence, and so on, are helping us to unravel the underlying causes of diseases and pave the way for more precisely targeted treatments, as well as more effective prevention methods. This will help to increase our health span and reduce the burden of chronic illnesses. The declining costs of computing and gene sequencing are also introducing healthcare to the world of deflation. Such developments are crucial to resolving the challenges of rising research and development costs in drug development and ever-expanding healthcare expenditure.

The problem of large numbers



Tool boxes

Tools 1

Collect data

DNA Sequencing

Imaging

Wearables

Tools 2

Interpret data

Computing Powers

Cloud

AI

Tools 3

Target diseases

Gene Therapy

mRNA

Antibodies

Our vision

We aim to invest in companies that have the potential to bring substantial improvements to human health and healthcare systems. We believe such companies are best positioned to deliver attractive investment returns over the long term. We also recognise that the most creative companies often lie at the intersection of different disciplines, driven by the convergence of technologies. Therefore, we mustn't limit our scope to the traditional definition of the healthcare sector.

One of the problems with investing in technological progress in health is the endemic short-termism that exists in listed equity markets. We believe that one of our most important roles is to engage with companies to encourage and protect the pursuit of an ambitious long-term vision. This means prioritising the long-term interests of the company over short-term financial market expectations and embracing the reality that success never comes in a straight line.

Visionary entrepreneurs with innovative solutions to healthcare needs all too often find their companies taken over at an early stage by 'big pharma'. While usually creating a quick win for investors, we think such acquisitions rarely lead to the realisation of truly exceptional long-term outcomes for either investors or society. For this reason, we believe a vital role for us is to encourage the management of such companies to resist the influence of investors with shorter horizons than their true potential.

We are well-placed to connect the people, ideas and capital that it takes to bring about meaningful change. Our role is not simply to provide capital, it is to help the realisation of scientific potential into successful companies, by acting within and contributing to an ecosystem of scientists, entrepreneurs, thought leaders, clinicians, researchers, public institutions and private companies.

Illustrina example

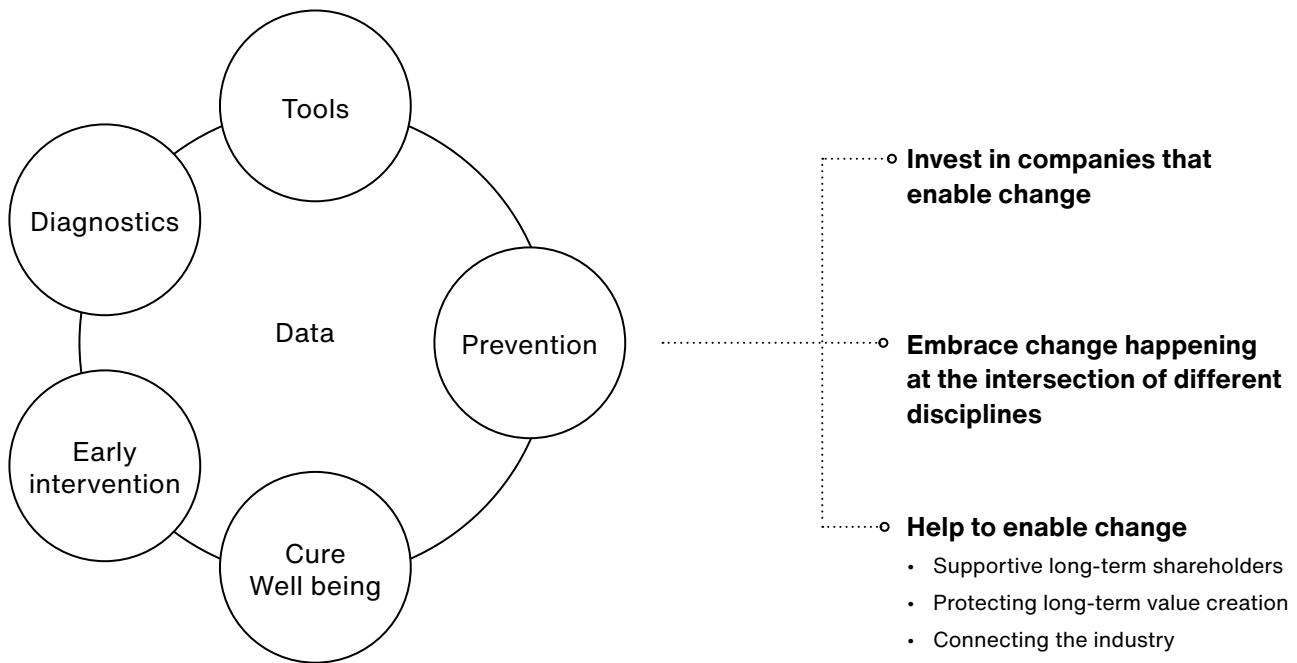
In the beginning of 2012, Roche made a hostile takeover bid for Illustrina after multiple failed attempts at engaging Illustrina's management in negotiation talks. Roche expected Illustrina's shareholders to welcome the opportunity to sell their shares at a ~60% premium over the one-month historical average share price.

At the time of the bid, we held c.12% of the company's shares on behalf of Baillie Gifford's clients. We decided to support Illustrina's management as we believed that Illustrina could deliver significantly more value to different stakeholders by remaining independent rather than by being part of Roche. Illustrina managed to fend off the hostile bid with support from shareholders, including Baillie Gifford clients, and eight years later, it looks like the company's independence was worth fighting for.

It is time to rethink what healthcare means

We want to play our part in speeding up the healthcare revolution.

The Health Innovation Strategy is designed to invest in companies that improve human health, lengthen healthy lifespans and reduce healthcare costs.



Why invest with Baillie Gifford?

Seeking only extraordinary companies

The healthcare sector, perhaps more than any other area, benefits from the asymmetric nature of investment returns. Companies developing technologies that meaningfully improve health outcomes for large segments of the population have the capability to grow exponentially. For example at a company level, academic evidence shows that over very long periods, the top 4% of companies in the global stock market created an amount of value equivalent to the entire rise in the market.¹

Our quest is to invest in such a way that we maximise the chance of owning those very rare exponential growers for long time periods.

Long-term investment horizon

We are long-term investors. Healthcare companies tend to have long lead times and may be more prone to setbacks than any other industry. Inevitably, there will be periods of market doubt and volatility, especially given that we invest in companies that operate at the cutting edge of science. Remaining patient and supportive shareholders during such periods is crucial if we are to benefit fully from the asymmetric return potential offered by these companies.

We focus on 'what if?'

Our experience of investing in change in other industries has taught us that opportunities lie in uncertainty and not in stability. We have learned that creativity and not accountancy is the essential skillset. Over the next several decades we expect to see profound changes in the ways we practice healthcare. Our experience of re-imagining possible futures in other industries and supporting outlier companies through periods of dramatic change is invaluable in helping us find and support future winners in healthcare.

Benefiting from multiple perspectives

Imagining what the future may hold requires mental flexibility. We need to imagine the potential implications of dramatic change and embrace uncertainty. We need to be ready to let go of preconceptions, while continuously learning and adapting our thinking to take into account what we have learned. Trying to be precise is the enemy of good investing. In times of profound change we believe our interdisciplinary approach gives us an advantage.

¹ Bessembinder, H., Cheng, T.F., Choi G. and John Wei, K.C. Do Global Stocks Outperform Treasury Bills? (July, 2019). The first author acknowledges financial support from Baillie Gifford & Co.

The data includes 61,981 CRSP common stocks from January 1990 to December 2018. In cases where stocks list or delist within a calendar period the return is computed for the portion of the period where data is available. Due to dual share classes; dollar wealth is assessed at the company level. Beyond the best-performing 811 firms, an additional 23,094 firms (37.8%) of stocks created positive wealth over their lifetimes. The wealth creation of these stocks was just offset by the wealth destruction of the remaining 37,195 (60.9% of total) firms, so that the top 811 firms created the same wealth as the overall market.

People

Health Innovation Team

The Health Innovation Team was formed by bringing together three existing Baillie Gifford investors who have spent significant amounts of time researching Health Innovation within broader investment strategies. Our enthusiasm in identifying extraordinary investment opportunities in this area led us to set up this strategy, which was seeded by Baillie Gifford Partners in October 2018. The three decision makers, Julia Angeles, Rose Nguyen, and Marina Record are supported by two dedicated investment analysts and a health systems specialist.

Decision makers



Julia Angeles*

Investment Manager
Health Innovation



Rose Nguyen

Investment Manager
Health Innovation



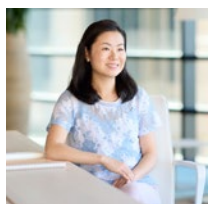
Marina Record

Investment Manager
Health Innovation



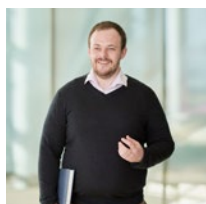
Maria Souza

Health Systems
Specialist



Jiaxi Liu

Investment
Analyst



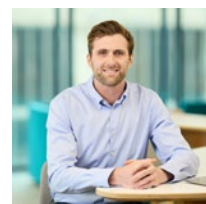
Michael O'Dwyer

Investment
Analyst



Diana Philip

Investment
Specialist

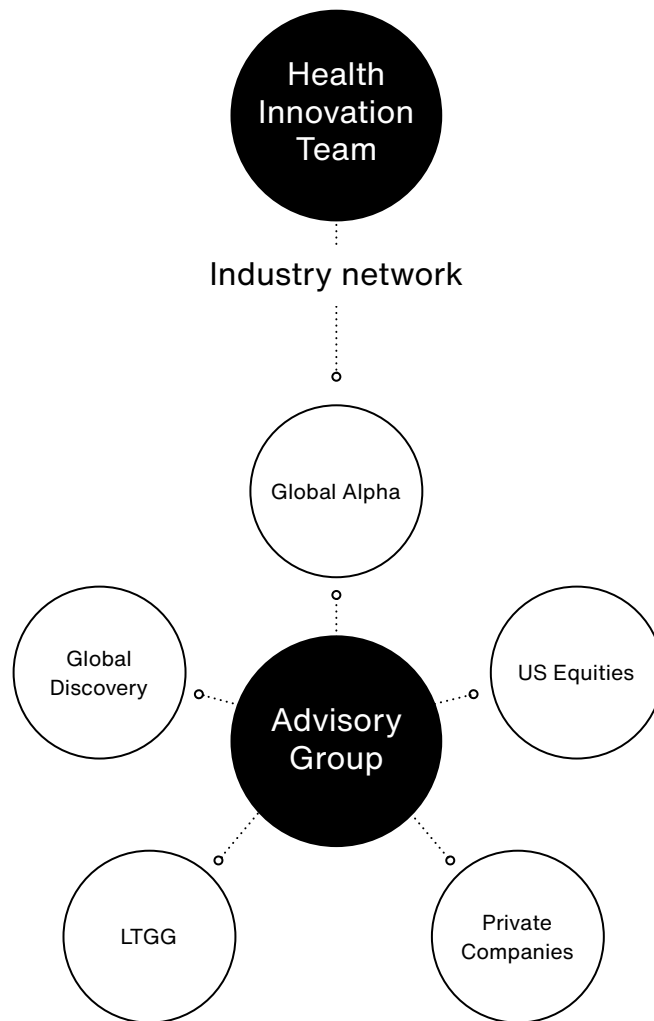


Richie Vernon

Investment
Specialist

* Partner

An ecosystem of discovery



Our industry network

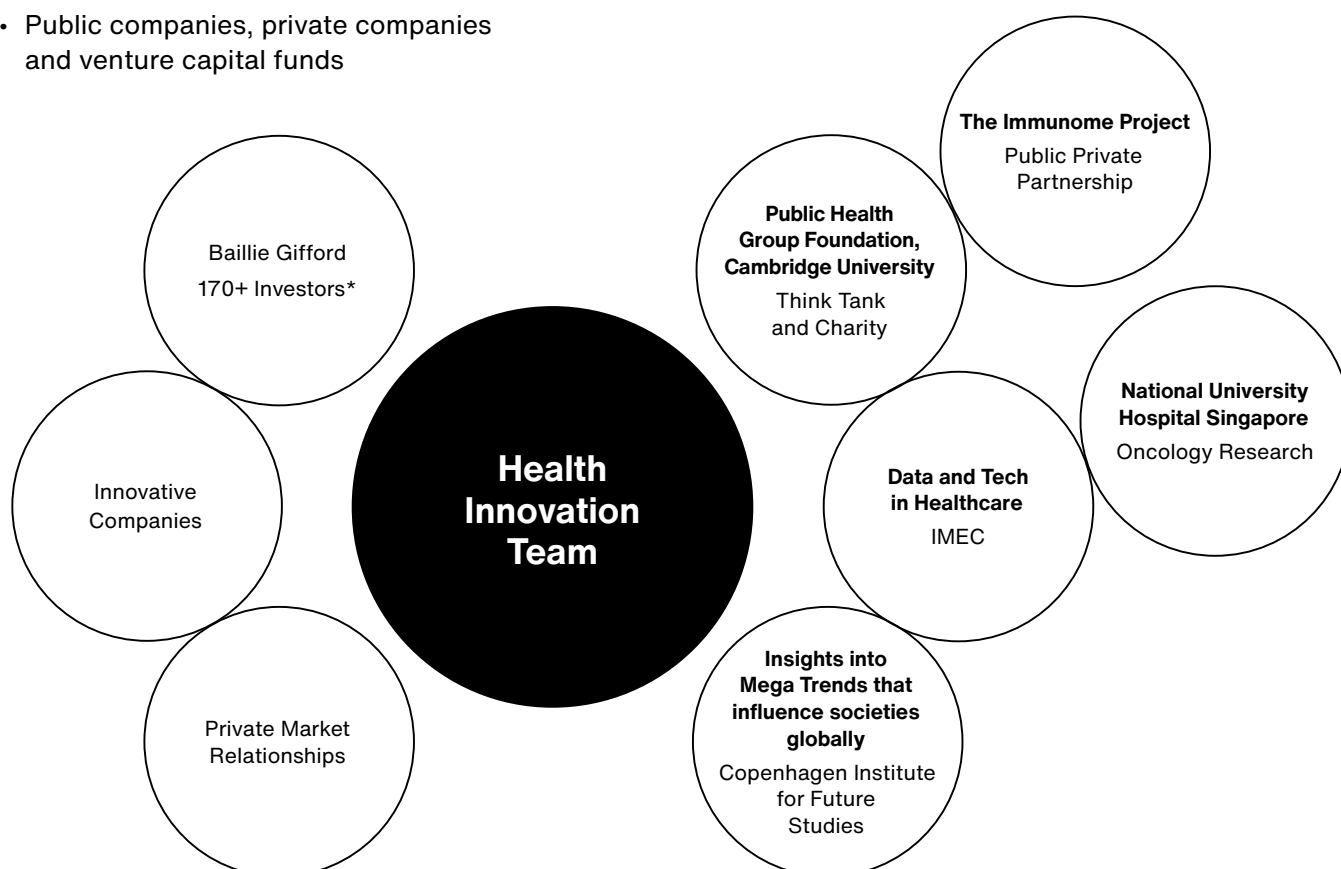
With medical knowledge presently doubling every few months, it would be futile to think that we can keep on top of the changes occurring without drawing on external guidance. Over the past five years, we have built up an extensive network of experts who help to expand our understanding of the fast-evolving world in which we live and provide us with a more specialised view of healthcare. These include relationships with:

- Leading scientists
- Entrepreneurs, who are at the centre of innovating change across the globe
- Thought leaders and writers, who can help us gain a better understanding of changing times
- Clinicians and researchers at hospitals and universities
- Public companies, private companies and venture capital funds

Network example

The Interuniversity Microelectronics Centre (IMEC)

IMEC is a world-leading research organisation for digital technologies. Baillie Gifford has a long-standing relationship with IMEC where we are granted access to their scientists and practitioners to discuss cutting-edge advances in the semiconductor industry and their potential impact across various industries. Discussions with their healthcare unit have included the innovation in genetic sequencing and imaging technology and how electronics could revolutionise cell and gene therapies. This has resulted in differentiated insights and new research.



*As at 31 March 2024

Investment process

The importance of diversity and creativity

No one knows exactly how the future is going to look. One of the key challenges for investors is dealing with uncertainty. While it is important that investors acknowledge such uncertainty, as it helps to counteract behavioural biases such as overconfidence, we must do more, we must actively embrace it. Our job is not about predicting the future but imagining the range of possibilities. Financial analysis on its own is unlikely to be helpful. We must remain open-minded and fight the temptation to anchor and extrapolate from the recent past, because this is likely to lead us to under-appreciating the potential for transformational change.

We believe that diversity of thought and creativity are very important in dealing with uncertainty. In order to develop these skills, we encourage a culture of curiosity, diversity and experimentation within the team. We don't look in the same places as other investors for inspiration and we seek a wide range of inputs into our research process. We encourage creativity and imagination by:

- Staying close to our global industry network
- Experimenting with different mental frameworks, for example, a science fiction way of thinking

Idea generation

We cover the whole spectrum of healthcare and the companies that we invest in typically advance:

- Understanding of diseases
- Diagnostics
- Treatments
- Prevention
- Operational efficiency of healthcare systems

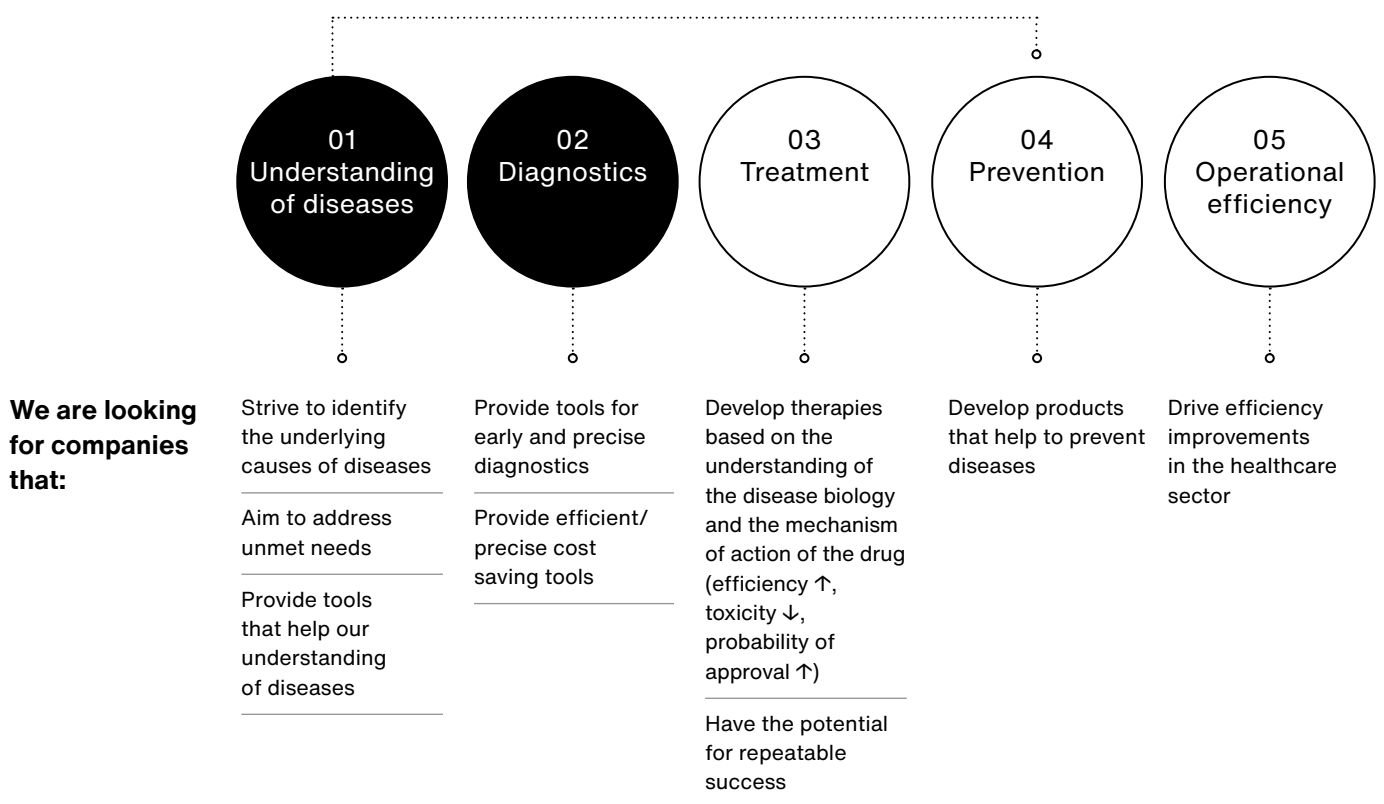
Idea generation is a multi-faceted process, and we believe the best way to generate ideas is to follow our interests and embrace serendipity.

New investment ideas can come from many different sources, such as thematic conferences, investment trips and conversations with thought leaders. We spend a lot of time thinking about challenges in each of the five areas above, as well as exploring how an ideal healthcare model might look in the future. For example, “what might a cure for cancer look like?”, or “how might progress in genome sequencing impact healthcare?”. While acknowledging we do not (and cannot) have all the answers, these visions of the future evolve continuously through conversations with our network of thought leaders, and public and private companies. More importantly, these mental frameworks help us to narrow our focus to align with potentially unique and transformational companies early on in their development.

If somebody describes to you the world of the mid-21st century and it sounds like science fiction, it is probably false. But then if somebody describes to you the world of the mid-21st century and it doesn't sound like science fiction, then it is certainly false. We cannot be sure of the specifics, but change itself is the only certainty.

Yuval Harari

Future winners in healthcare



Research

Our research process follows a framework of ten questions that drives us to focus on key issues and increases our chances of identifying future winners.

Dialogue and discussion

We meet every quarter with the Advisory Group to discuss thematic and company research.

The cognitive and background diversity of the group helps us to challenge new and existing ideas, advance our thinking about investment opportunities and identify areas of additional research. Investment decisions are not taken at this meeting.

Decision

The Health Innovation Team meet every six weeks to review the portfolio and make investment decisions. They also discuss work in progress, the research agenda, risk reports and any meaningful news from our holdings.

There is a strong emphasis placed on backing the individual rather than achieving consensus. The most rewarding investment ideas can be both highly uncertain and controversial, and we believe requiring consensus on decision-making would reduce the likelihood of buying such companies. In practice, this means that a holding can be taken if it has the backing of only one member of the team.

Portfolio construction

We run one model and expect all clients to invest in it. This strategy seeks to benefit from asymmetry so in general we expect to run winners up to potentially large holding sizes.

We will sell companies where we think the fundamental investment case has changed.

We believe that seeking good stock ideas to hold at an early stage in their development is far more important than maintaining a strict sell discipline or obsessing over near-term valuations.

10 question framework

01

What problem does the company solve for the healthcare system?

02

What are the other ways to address the problem?

03

What is the market opportunity?

04

Why should the company remain relevant in the future?
How repeatable is its success?

05

Does it have a differentiated culture?

06

What is the evidence that the company cares about patients?

07

What is a long-term level of profitability?
How does it allocate capital?

08

How confident are we that this company can deliver at least 2.5x return over five years?

09

Does this company have potential to be an outlier?

10

How do we monitor progress?

Investment risk

A different approach

The Health Innovation Strategy is designed to enable our clients to invest in a concentrated portfolio of companies that can transform human health and healthcare systems around the world. These companies are operating at the cutting edge of science and are challenging the status quo, meaning they may be subject to higher levels of volatility than the wider market. However, if they can deliver on those ambitions, the potential rewards available are manifold.

We will therefore not shy away from taking risk – which we define as:

- the possibility of the permanent loss of capital in individual investments and
- a failure to have enough invested in companies with sufficient upside potential to offset the inevitable setbacks.

At the portfolio level, we believe there are three primary components to mitigating investment risk: ambition, patience and diversification.

Ambition pertains to the upside potential of our investments. We ask what it would take for each one of our investments to deliver more than 10x return over 10 years and how likely this outcome is. This helps mitigate the risk that we fail to identify companies with sufficiently large upside potential.

Patience is key in supporting our investee companies as shareholders to see the upside materialise. Some of our companies will require capital as they continue making progress. Our ability to be supportive shareholders and to realise the upside potential could be impaired if a large part of our portfolio requires funding at the same time. Baillie Gifford's Investment Risk, Analytics & Research Department help us to monitor the measures of companies' financial independence.

Diversification refers to the portfolio's concentration and characteristics of the companies that we invest in and will include consideration of the stages of clinical maturity of the companies in the portfolio. Baillie Gifford's Investment Risk, Analytics & Research Department identify and challenge concentrations expressed in the portfolio that may lead to permanent loss of capital at the portfolio level.

Portfolio characteristics

Number of holdings	25–50 companies.
Portfolio concentration	Pooled vehicles in this strategy adhere to a UCITS structure, a maximum of 10% will be invested in one individual stock and a maximum of 40% will be held in stocks with greater than 5%. For segregated mandates a maximum of 15% will be invested in one stock not to be topped up when the position exceeds 10%.
Time horizon and turnover	Investment time horizon of 5–10 years. Portfolio turnover will be low in keeping with this long-term approach and is anticipated to average below 20% per annum.
Comparative benchmark	The MSCI ACWI Healthcare Index.
Performance	<ul style="list-style-type: none"> • The primary aim is to generate attractive long-term returns. • The strategy is managed without regard for tracking error or benchmark relative risks, while we aim to outperform the wider market in the long term.

Biographies



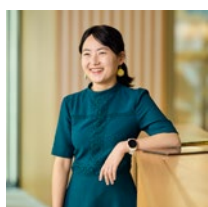
Julia Angeles*
Investment Manager

Julia joined Baillie Gifford in 2008 and became a partner in 2022. Julia is an investment manager in the Health Innovation Team which she co-founded in 2018 and is also a member of the International Growth portfolio construction group. Since joining Baillie Gifford Julia has worked on a number of regional and global investment strategies. Julia has a passion for the transformation taking place in healthcare, and it was this passion which led to the establishment of the strategy. She believes that over the next 10 years healthcare systems around the world will experience a monumental change and we will witness a move away from reactive medicine to a world where prevention and cure will become an integral part of healthcare driven by technology. Julia previously worked as a Management Consultant at McKinsey & Company advising firms in Denmark, Russia and Hungary. Julia obtained a BSc in 1999, MSc in 2001 and PhD in 2005 in Economics from the University of Aarhus, Denmark and speaks fluent Russian and Danish.



Marina Record
Investment Manager

Marina joined Baillie Gifford in 2008 and is an investment manager in the Health Innovation Team. She worked in a number of global teams before joining Long Term Global Growth, where she focused on analysing companies with the potential for sustained rapid growth. It was here that Marina developed an interest in healthcare, intrigued by the accelerating pace of progress in the field. She joined the Health Innovation Team in January 2018 as an investment manager, to fully focus her attention on exploring the potential consequences of such progress and how Baillie Gifford can help. Marina graduated from the London School of Economics and the Higher School of Economics in Russia with BSc degrees in Banking and Finance and in Economics, having studied on these programmes simultaneously.



Rose Nguyen
Investment Manager

Rose joined Baillie Gifford in 2013 and is an investment manager in the Health Innovation Team. Rose worked on various regional and global strategies before joining the Health Innovation Team as an investment manager in September 2018 at the inception of the strategy. Having observed the innovations in multiple industries, she believes that the great convergence of different technologies and sciences will ultimately transform life science. Biology can move from alchemy and randomness to become a more predictable, deterministic and repeatable science, that will give rise to a plethora of exciting investment opportunities. Rose graduated BA (Hons) in Economics and MPhil in Finance and Economics from the University of Cambridge in 2012 and 2013 respectively.

*Partner



Jiayi Liu
Investment Analyst

Jiayi joined Baillie Gifford in 2016 and is an investment analyst in the Health Innovation Team. Prior to joining the team, she also worked in the Global Income Growth Team. Jiayi graduated BA/BMus from Northwestern University in 2009 before obtaining a Double Masters in Piano Performance and Musicology from The Peabody Institute of the John Hopkins University in 2011. She also gained a PhD in Music Cognition from the University of Cambridge in 2016.



Michael O'Dwyer
Investment Analyst

Michael joined Baillie Gifford in 2022 and is an investment analyst in the Health Innovation Team. Prior to Baillie Gifford, Michael worked as a postdoctoral researcher at the Scottish Centre for Regenerative Medicine at the University of Edinburgh. Michael graduated with BA in Human Genetics from Trinity College Dublin in 2015 and PhD in Stem Cell Research from the University of Edinburgh in 2021.



Maria Souza
Health Systems
Specialist

Maria joined Baillie Gifford in 2021 and is a health systems specialist in the Health Innovation Team. Prior to Baillie Gifford, she worked as a project manager with UN Agencies in the US (mainly UNICEF). Maria also spent time as the Senior Biologist at the Brazilian branch of Engie-Tractebel Engineering. Maria is a qualified Biologist and obtained MSc in Ecology, Conservation and Management of Wildlife in 2005, from the Federal University of Minas Gerais (UFMG), Brazil.

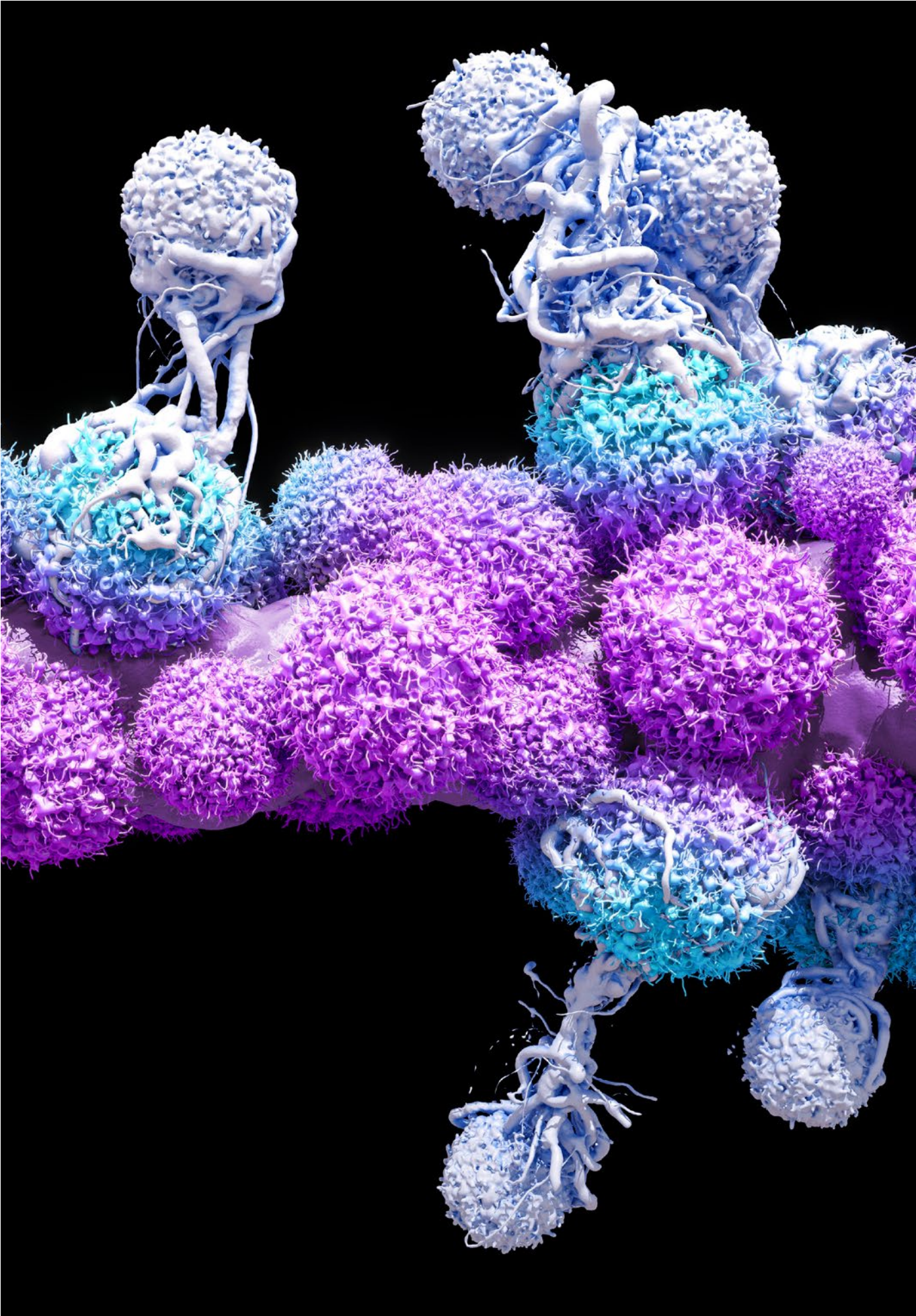
Supporting longevity

Our partnership structure

We believe that no investment firm, however rigorous its approach, can consistently achieve great things for clients if the right corporate conditions are not in place. Baillie Gifford is an independent investment manager, wholly owned by 58 partners who work within the firm. The partnership structure has prevailed for over 115 years and enables us to take long-term views. We see it as a key strength.

We are not a faceless corporation, we are a place where we do everything we can to let individuals thrive and ideas flourish. Our satisfaction comes from the pursuit of knowledge and its application to investments, knowing that if we do a good job, as well as achieving outperformance for clients, we will have contributed to society's progress too.

The partnership
structure has prevailed
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long-term views



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bailliegifford.com/healthinnovation

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