



Right to the heart of the matter

The future of treatment for cardiovascular diseases could lie in cell and gene therapies, with biotechnological advances paving the way for individualised therapies.



Philip Larsen, senior vice president and global head of research and early development at Bayer AG Pharmaceuticals.

Cardiovascular diseases remain one of the largest health challenges across the globe and the world's leading cause of death. But novel biotechnological advances, particularly in cell and gene therapies, offer great potential to provide optimal care for patients, and to aid in the early diagnoses and treatment of heart conditions.

"Considering the global change in demographics, a growing proportion of elderly patients will pose a challenge to health expenditure in the near future. To tackle this directly, the medical community will have to introduce more personalised

approaches to heart disease management," says Philip Larsen, senior vice president and global head of research and early development at Bayer AG Pharmaceuticals. "Cell and gene therapies could become viable alternatives to heart transplantation and complex mechanical cardiac assist technologies."

Cell and gene therapies target diseases at the molecular level, and are designed to repair or replace damaged or dysfunctional cells and genes before serious illness takes hold. This fledgling yet flourishing field holds great potential for the treatment and possible prevention of multiple diseases and hereditary conditions. Such therapies could open doors to personalised, targeted treatments, with drugs and therapies tailored specifically to an individual's needs.

"Cell and gene therapy for cardiovascular disease is still a young field of research and many uncertainties have to be managed satisfactorily before patients can directly benefit," explains Larsen. "Nevertheless, the field is facing some imminent breakthroughs. With this in mind, Bayer has recently acquired two companies with the aim of pursuing

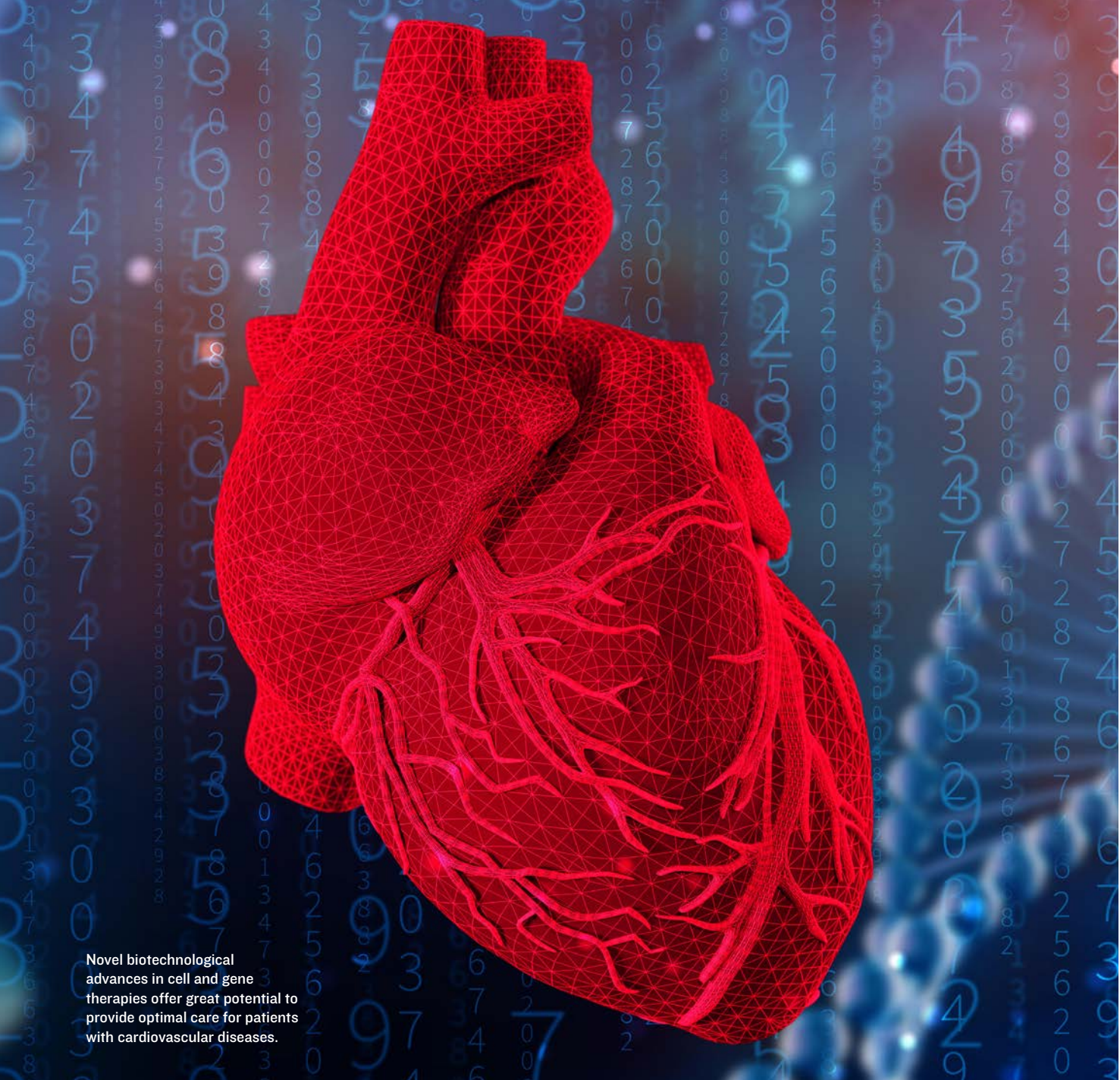
these potential treatment pathways for patients with cardiovascular disease needs."

The two companies are Asklepios Biopharmaceutical, a gene therapy company, and a cell therapy company called BlueRock Therapeutics. BlueRock is developing and investigating stem cell technology that can replace cells in the body that are lost or damaged due to diseases including cardiovascular and neurological disorders. Asklepios Biopharmaceutical is examining targets such as the gene mutations that make cardiovascular diseases more likely, and currently developing a gene therapy approach for congestive heart failure.

According to Larsen, both companies will initially be operating as independent entities in the Bayer family with their own R&D agendas, but with the aim of introducing novel products to Bayer's various pharmacotherapeutic franchises, including their cardiovascular offerings.

"The applied sciences of biotechnology bridge all aspects of disease—from providing deep insights into how diseases function, to informing practical therapeutic solutions," says Larsen. "This makes the field a very





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ARTEM OLESHKO / ALAMY STOCK PHOTO

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exciting place to be involved in at present.”

Larsen has noticed key changes in the biotechnology and pharmaceutical industries in light of the COVID-19 pandemic, not least a wider appreciation of the roles of biotechnology manufacturing and regulatory practices. With the whole world focused on the pandemic, this may accelerate the industry’s implementation and dissemination of novel technologies such as mRNA-based products, notes Larsen.

“The pandemic has taught us to de-bureaucratise workflows, with resulting heightened agility and increased flexibility,” he says. “At Bayer, we do not have an obvious right to innovate in the field

of antivirals or vaccines. Rather, we have employed our expertise in cardiovascular medicine to join forces with academic centers to improve our understanding of the medical consequences of COVID-19 and so-called long-COVID syndrome.”

Larsen is particularly excited to see how virtual and decentralised clinical trials are winning acceptance across the globe. “The pandemic has accelerated the implementation of such practices, which has broadened the reach of medical innovation to far more patients and medical centers, and will ultimately help boost the confident dissemination of novel therapies,” he says.