Musculoskeletal disease research at Novartis

Exploring new frontiers to restore patient mobility and independence.

Musculoskeletal diseases negatively impact the quality of life of hundreds of millions of people globally. These diseases cause pain and discomfort, limiting the range of movement and activities of people living with these conditions.

The mission of our Musculoskeletal Disease (MSD) research team is to restore mobility and independence to patients with some of the most intractable of these debilitating conditions.

An advanced MRI image of a human knee, courtesy of Siegfried Trattnig. These cutting-edge scans differentiate between high-quality (bright green) and defective cartilage. (Image modified and adapted for the web by Fidelis Onwubueke.)

Our research focuses on finding innovative therapies for three musculoskeletal disease areas, for which there are currently no effective drug treatments:

- **Osteoarthritis**
- **Tendinopathy**
- **Devastating neuromuscular diseases**

Novartis pursues pioneering research in MSD – a field that has traditionally seen limited progress in development of effective therapies. We have made bold commitments to musculoskeletal discovery research in order to address this historically difficult terrain. We pursue novel regenerative approaches for osteoarthritis and tendinopathy and unique treatments for specific neuromuscular diseases.

Our researchers are unraveling the complex biology of these diseases – identifying targets and interrogating biological systems suspected of playing a role in disease. Additionally, we’re exploring novel clinical endpoints, such as biomarker discovery and the development of digital tools to assess mobility and new, translational imaging approaches. For example, we’re working with colleagues to use advanced magnetic resonance imaging (MRI) technology to see molecular changes deep inside the knee to assess the effectiveness of therapeutics to regenerate cartilage.

Progress in such uncharted territory demands an openness to new approaches and space for iteration. The team is committed to discovering new therapeutic modalities, from small molecules to biologics and gene therapies, to treat patients. The flexibility required to be successful in this endeavor is reflected in our multi-disciplinary approach: our team includes cell and developmental biologists, data scientists, bioengineers, neuroscientists and drug hunters.

“We are committed to tackle the vast unmet medical need in musculoskeletal disease and bring novel therapeutic options to patients. This takes an appetite and dedication to high-risk exploration and we must be agnostic about how we get to a new medicine, whether by serendipity or design, molecule or biologic,” says Michaela Kneissel, Global Head of the Musculoskeletal Disease Area (MSD) at the Novartis Institutes for Biomedical Research.

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