Dear TUM friends and associates,

The global population is rising at breakneck speed by the size of Erlangen every day, Munich every week and New York every month. At the same time, natural resources are becoming scarcer, we are threatened by the repercussions of climate change and diet-related diseases are on the rise. Consequently, science, business, politics and society are facing pivotal questions that will determine mankind's survival: How can we secure the sustainable production of sufficient quantities of food? And how can we produce food that is tasty and allows people to eat healthily?

As an active researcher, I have spent the last 25 years studying key molecular questions regarding food quality. In my position as the new President of Technische Universität München, I feel myself all the more committed to the moral obligation to harness research, innovation, education and further training to make strong contributions to identifying relevant solutions. This requires interdisciplinary research approaches along the entire Agriculture ▷ Food ▷ Nutrition chain. Equally, we need a completely new system awareness covering the complex network of effects of biologically relevant substances – from raw materials to the sustainable production of customized food, to its physiological effects and wider questions of lifestyle.

No other university in Germany is as expertly structured as TUM, marshaling the strengths of the TUM School of Life Sciences at the Weihenstephan campus, the TUM Straubing campus for Biotechnology and Sustainability, the engineering sciences including Computer Science at the Garching campus, as well as the strong Medical and Health Sciences in Munich. These strengths are complemented by the technically oriented social, political and business sciences with an interdisciplinary approach.

Based on a selection of focus topics, this issue of Faszination Forschung covers a wide range of topics: From active taste molecules which determine our predilections for certain dishes to the complex metabolic processes in the human body and in coupled ecosystems, including plant and animal breeding, to the technical systems behind sustainable food production.

Professors Hans Hauner, Dirk Haller and Martin Klingenspor are studying the genetic and molecular foundations of metabolic processes and their repercussions on diseases such as diabetes, Crohn's disease and obesity. Prof. Michael Schemann is conducting research into the nervous system of the intestines and their malfunctions, which can cause irritable bowel syndrome in humans.

Professors Chris-Carolin Schön, Kurt Hülsbergen and Dr. Franz Xaver Maidl are harnessing innovative approaches to breeding sustainable, future-viable crops. Dr. Mario Jekle is studying the thousands of years old food that is bread. He is drawing on 3D printers to analyze how to bake bread with crispy crusts on the outside and soft and fluffy crumb on the inside. "Vertical farming" is a decidedly innovative approach to plant cultivation. Prof. Ferdinand Ludwig and Dr. Mariana Yordanova are developing multifunctional building facades for this purpose.

Water efficiency and energy efficiency are important ecological and economic factors. Using the example of the brewing process, Dr. Karl Glas has designed a microbial fuel cell that treats wastewater while simultaneously generating electricity. Water is also the subject of the company founders working with TUM graduate Fabian Schlang. They have developed a drinking bottle which imbues water with flavor purely by means of aromas, as a healthy alternative to the usual soft drinks.

I hope you enjoy reading this issue of Faszination Forschung.
Yours,

Thomas F. Hofmann
President