

More information about the research division „Plant and Food Science“

Plant science in the division has two main focuses, plant-pathogen interactions and secondary metabolites. Work on plant-pathogen interactions includes the development of novel plant protection strategies, rapid pathogen determination and elucidation of fundamental aspects of various plant diseases. Projects with food and feed industry aim at the optimization of aroma, colour stability and nutritional value with respect to secondary plant metabolites and on the development of innovative and sustainable products. Pigmentation as easily accessible model is used for the investigation of the formation of secondary metabolites in plant tissues. Fundamental questions concerning the formation of secondary metabolites, their tissue specific accumulation and their formation at the subcellular level are addressed. A broad spectrum of methods is used including molecular, enzymatic, analytical, microscopic and biotechnological techniques. The obtained knowledge can be used for the development of molecular breeding strategies but addresses also many aspects of everyday's life as secondary metabolites fulfil important functions in plants and also in humans when plant diets are consumed.

A major role plays the characterization and identification of the organic matter occurring in all sorts of natural products stemming from the immediate present but also from historical times. The fields of activity are focused on plant and oilseed (lipids, flavouring substances, aflatoxines, opiates and microorganisms) as well as residue analysis (pesticides and antibiotics in honey, beeswax and propolis; organic compounds on metal foils for food packaging). There is also a long experience in the organic identification of fats, natural dyes, waxes, resins and pitches of archaeological objects (potteries, manuscripts and textiles). Microscopical (light microscopy, SEM/EDX and TEM) and chemical chromatographic methods like Py-GC/MS are applied, for which the informative value is very high and only tiny quantities of samples are needed.

The scopes of food science comprise the investigation of the structure, the composition and the properties of foods. The quality of foodstuffs depends on the structure and amount of essential components and additives as well as on contaminants, the safety aspects are based on the occurrence of nutritional and toxicological relevant components. New technological processes and methods for production, preservation and storage may cause significant changes in foodstuffs which have to be analysed and evaluated, even if they only can be found in traces. In addition to teaching activities concerning general food chemistry, food technology and food analysis the main competence is focused on functional food, food supplements, food additives, food microbiology, preservation, food plant sanitation, packaging of foods and contamination caused by the environment and processing. Further priorities concern cosmetic products as well as consumer products including child articles, disinfectants or other products influencing the health of consumers. These research fields require an interdisciplinary cooperation with producers, nutritionists, physicians and consumer organisations.