

Module number	MM7
Module name	Applications of genomics in agriculture
Program of Study	MSc mandatory module
Offered	Once a year, summer semester
Module coordinator	Prof. Dr. Daguang Cai
Module advisors	Prof. Dr. Georg Thaller, Prof. Dr. Karl H. Mühling, Prof. Dr. Daguang Cai, Prof. Dr. Christian Jung
Courses and teachers	Lectures: Applications of genomics in animal breeding (G. Thaller) Application of genomics in plant breeding (C. Jung) Application of genomics in plant nutrition (K. H. Mühling with Dr. C.-M. Geilfus and Dr. G. Schulte auf'm Erley)) Application of genomics in Phytopathology (D. Cai)
Prerequisites	Advanced understanding of genetics, molecular biology, animal and plant breeding as well as plant nutrition and phytopathology
Language	English
Module capacity on campus students	20, Registration starts one week before lecture beginning At the secretary' s office of the Institute for Phytopathology, CAU, Hermann-Rodewald-Str. 9, 3 th floor, room 321
Module capacity off campus students	5
Course types (classroom/ total workload)	Lecture (15 h /45 h), lecture (15 h /45 h), lecture (15 h /45 h), lecture (15 h/45 h)
Schedule	Weekly
Grading	Oral exam: 50% (G.Thaller, D. Jung), 50% (Mühling, D. Cai)
ID-card	Required for exams
European Credit Points	6
Module Objectives	Advanced understanding of the application of genomics in agricultural research and practice.
Contents	<ul style="list-style-type: none"> ▪ Genomics of inherited defects and disease resistance in livestock; procedures and techniques to identify causal genes and causal polymorphisms including SNPs and CNVs. ▪ Application of genomics in plant genetics and breeding: Genomics based selection, genomic resources for markers, genomics for increasing genetic variation, gene identification from plant genomes ▪ Genomics of plant defence systems: PTI, ETI, R genes and RGAs; genetic and technical engineering of plant disease resistance; genomics-based molecular diagnosis; molecular plant-parasite interaction-based plant protection strategy ▪ Molecular characterization of transport carrier and channels, quality aspects as affected by plant nutrition, molecular adaptation and tolerance mechanisms under abiotic stresses
Taught Skills	Professional and practical key competence
Course materials	Printed contents, review articles and textbooks, internet links.