

Bioanalysis (Genomics, Proteomics, Metabolomics, Phytomics)

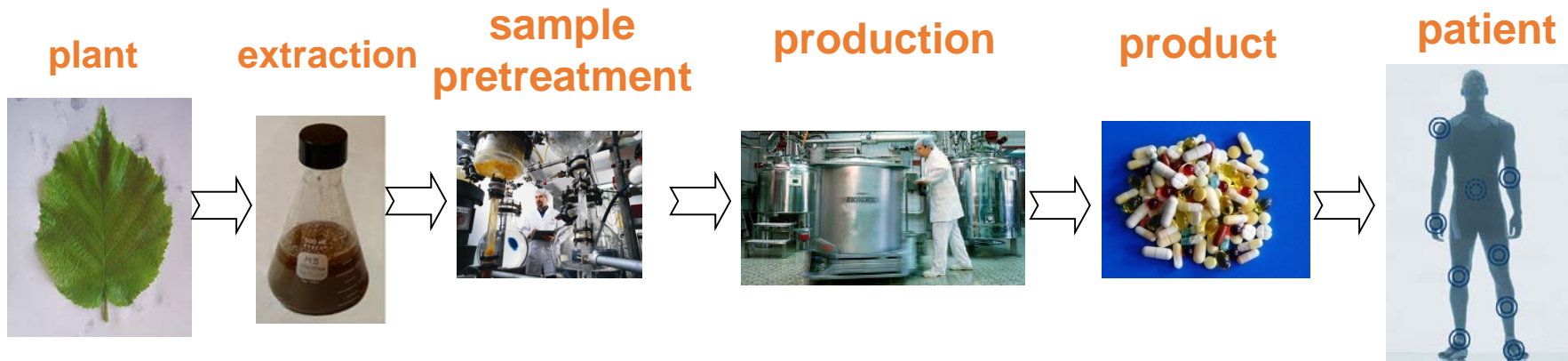
Biological samples are commonly considered to be complex matrices. The analysis of such samples requires an adequate sample preparation step prior to the separation, detection and quantitation. Since the sample pretreatment is a time-consuming procedure, various systems have been developed to couple sample preparation with the separation-, detection-, quantitation-step in order to speed up the procedure and to eliminate error-prone handling. The research at the Institute of Analytical Chemistry and Radiochemistry focuses on new developments in integrated sample preparation and separation systems for genomics, proteomics, metabolomics and phytomics. Several chemistries are available for a wide range of applications which can be tailored to a specific application allowing endless possibilities in terms of selectivity tuning. Solid-phase extraction has been performed with various nanomaterials packed, embedded or coated on the walls of the pipette tip. The micropipette tip format permits the handling of submicrolitre amounts of samples. Advances in mass spectrometry have made it possible to analyze complex samples addressing the needs in bioanalysis.

Bakry, R., Rainer, M., Huck, C. W., & Bonn, G. K. (2009). New stationary phases for enrichment and separation in the 'omics' era. Bioanalysis, 1(1), 151

Rainer, M., and Bonn, G.K. (2015), Enrichment of phosphorylated peptides and proteins by selective precipitation methods. *Bioanalysis*, 7.2: 243-252

Analytical Chemistry in Phytopharmacy

Steps for Quality Control



Selective materials for sample pretreatment:

particles (spherical, irregular)
 monoliths
 SPE, columns, disks

Stationary phases for HPLC and μ -HPLC:

particles (different mechanisms)
 monoliths

Screening: MALDI targets/MELDI materials:

matrix free
 with matrix

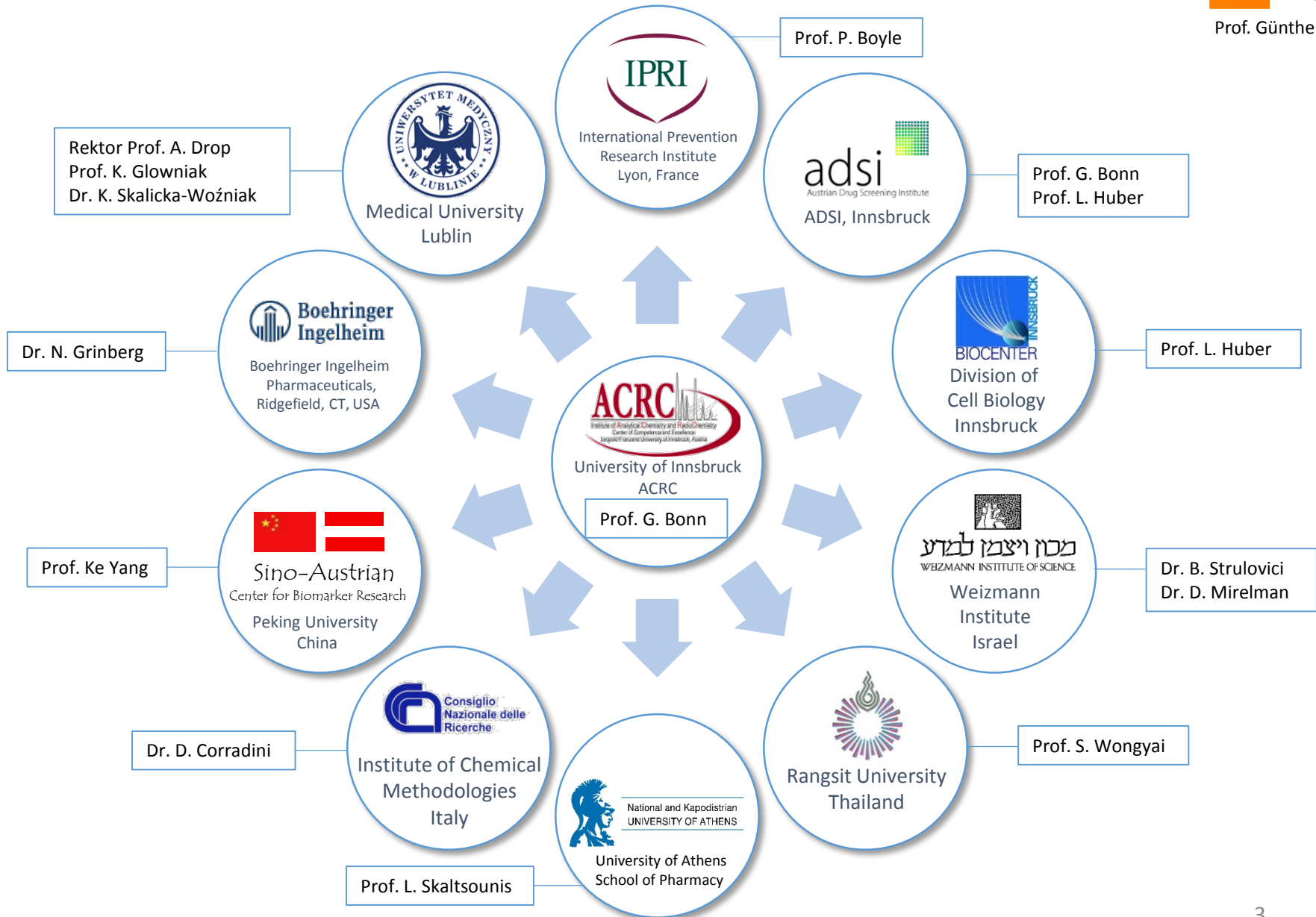
Hyphenated techniques:

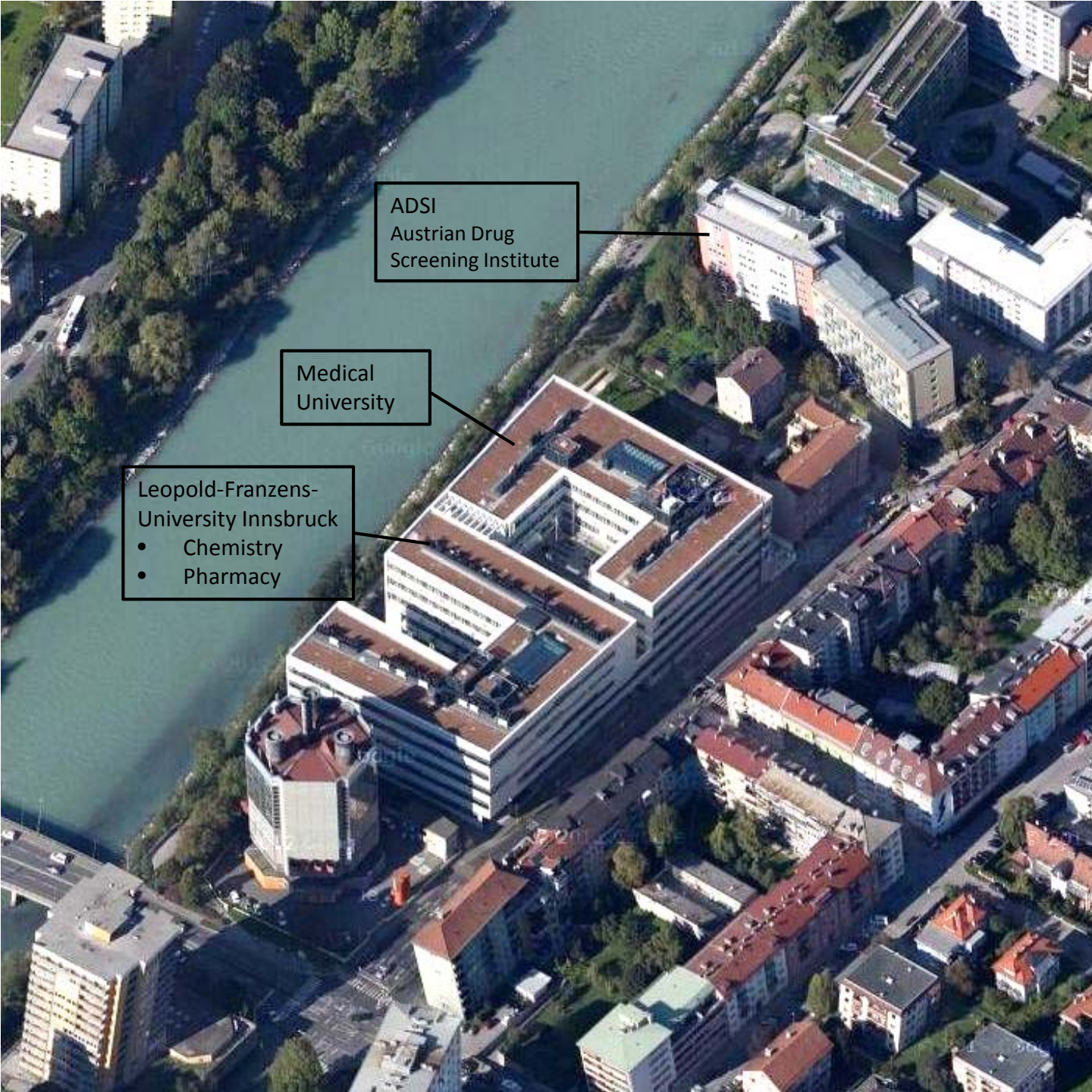
μ -HPLC-ESI-MS
 μ -HPLC-MALDI-TOF MS

Infrared Spectroscopy:

non-invasive quality control

Scientific Collaborations





ADSI
Austrian Drug
Screening Institute

Medical
University

Leopold-Franzens-
University Innsbruck

- Chemistry
- Pharmacy

Center for Chemistry and Biomedicine (CCB)

Data & facts in terms of the building:

start of construction: Sept. 2008
finishing: Mai 2012
investment: over 90 Mio Euro
total floor space: 36.140 m²
underground parking: 4.050 m²
gross floor area: 46.120 m²
gross room capacity: 192.030 m²
rooms: 816
doors: 1000

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