



MCA Technologies GmbH (Switzerland)

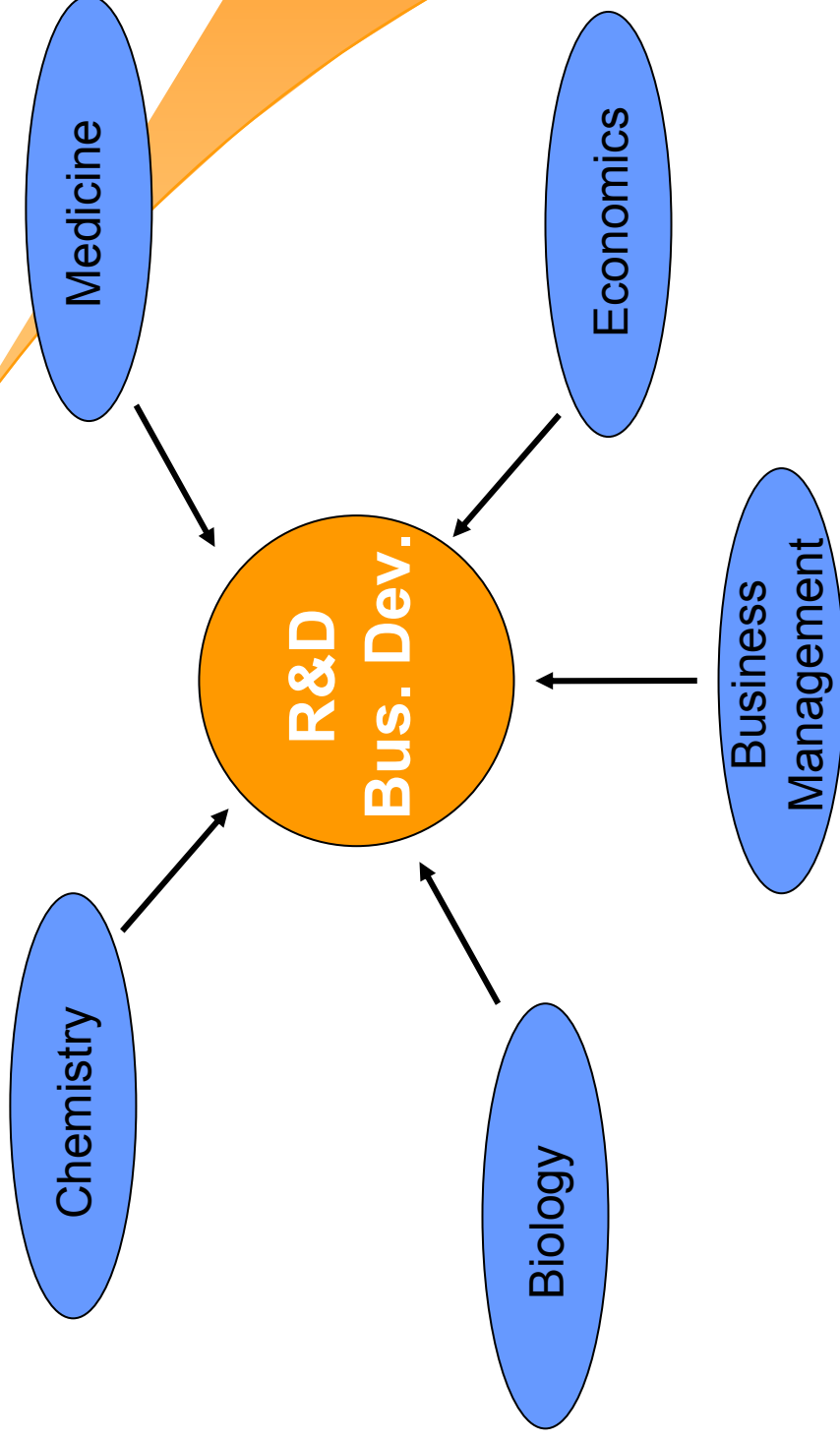
Supporting R&D and Business Development
in the Chemical and Life Sciences Industries

Background



- Swiss company, located in Biel-Benken (BL)
- Founded in 2002 as Extension of Medchemadvice, founded in 1989
- Management
 - Dr. chem. B. L. Kaul: Former Global Head PTR, Clariant (Sandoz) ; over 60 US patents & 30+ years of experience directing, from conception over scale-up to full-scale production and worldwide registration (marketing) of over 20 chemically new molecular entities (CNMEs)
 - Dr. med. S. Kaul: 20+ years of experience as independent consultant for the advancement of knowledge related to health sciences and medicine

Core Competence



Mission Statement



- Strategic source development, and development and tailoring of novel and advanced technologies for biochemical, chemical/pharmaceutical (APIs) and related products & processes in co-operation with clients, consultants, research institutes and universities world-wide
- Dissipation of knowledge & experience to small-/medium-size enterprises (technology transfer)

Areas of Activity



- Contract drug discovery & development support services
- Captive and contract R&D and manufacturing
- Products and new product developments
 - Active Pharmaceutical Ingredients & Intermediates
 - Personal Care Ingredients (Cosmetics)
 - Food & pharmaceutical and cosmetics colorants: natural & synthetic
 - Natural health care ingredients and products (Nutraceuticals)
- Strategic sourcing and marketing concepts
- Strategic alliances and co-operation facilitation

Value Proposition



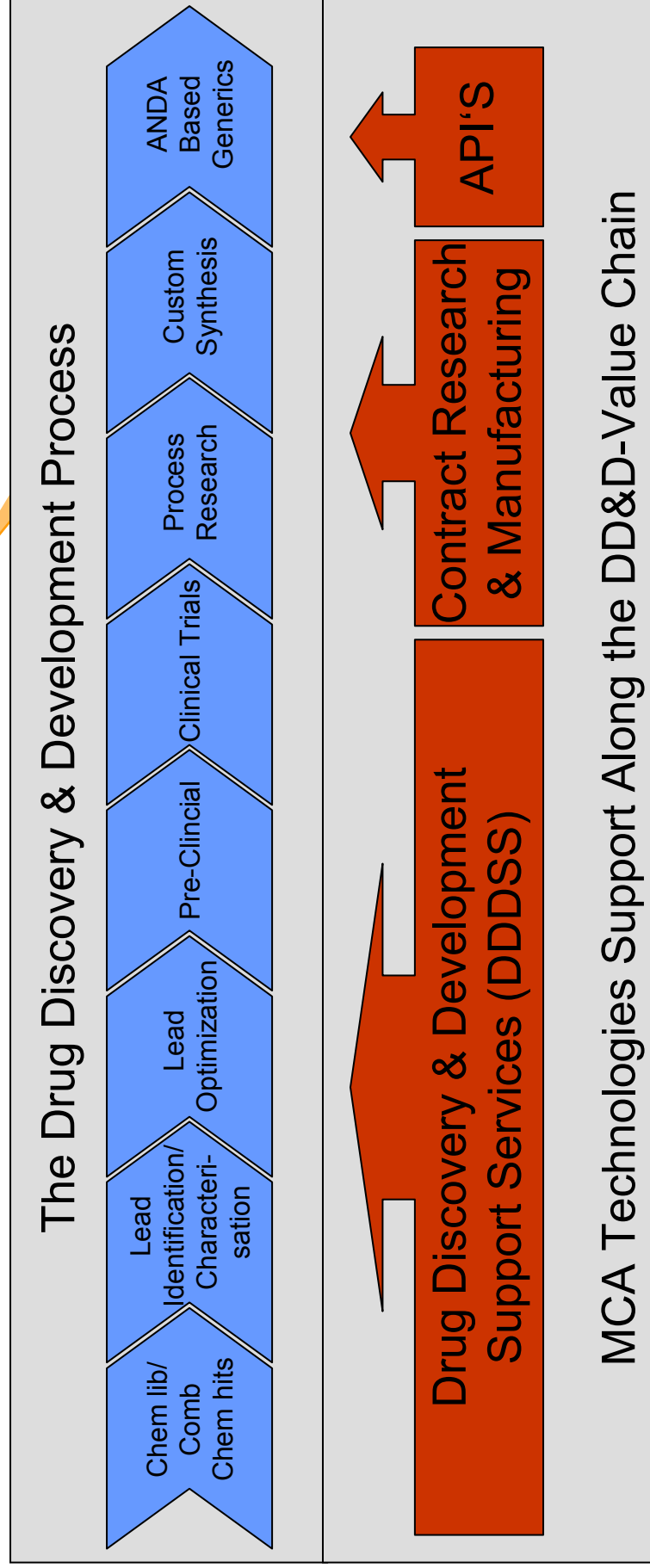
- Maximal efficiency & flexibility in outsourced R&D projects assured through long-established global networking with universities, research labs, CROs and analytical companies world-wide.
- Scalable cGMP-compliant manufacturing through technology IP and established global partner network
- Highly competitive product prices, assured quality and speedy delivery on selected specialty & functional chemicals and biochemicals & -molecules (APIs) as a result of better supply-chain management (pre-sourcing) and joint process-improvements and developments coupled with minimal overheads.
- Effective Asian distribution and marketing channels for Western products in India, China, Japan and South Korea

Partner Network (Selection)



- ▢ Contract R&D (medicinal chemistry, analytical chemistry, drug metabolism and pharmacokinetics, CV safety, CNS Pharmacology, bio analysis, regulatory dossier preparation): India, China, EU
- ▢ API & precursors (CNS, prostaglandins, anti-aids, oncology, steroids): India, China
- ▢ Bionanotechnology and biosensors: United Kingdom
- ▢ Intellectual property evaluation & protection: Switzerland
- ▢ Logistics and sourcing: China, India, EU
- ▢ Marketing & distribution: Germany, Switzerland, South Korea, India, China, Japan
- ▢ Engineering, plant & equipment: Germany
- ▢ Support for development of drug delivery systems/formulations: Switzerland
- ▢ Analytical labs (Swiss GLP & GMP accredited labs): Switzerland

Business Model: Drug Discovery & Development



Contract Drug Discovery & Development Support Services



Collaborative research in full-spectrum from drug design to

clinical trials

- ▢ Medicinal Chemistry
- ▢ Analytical Chemistry
- ▢ Drug Metabolism and Pharmacokinetics
- ▢ CV Safety
- ▢ CNS Pharmacology
- ▢ Bio Analysis
- ▢ Regulatory Dossier Preparation

Example: Medicinal Chemistry



- └ Lead Generation & Optimization
- └ SAR Design & Synthesis
- └ Metabolite & Impurity Synthesis
- └ Physico-Chemical Properties
- └ Structure Elucidation & Confirmation
- └ Pharmaceutical API Analysis, Stability Studies & Impurity Profile
- └ Analytical Method Development & Validation

Example: CNS Drug Development



- ▢ In-vivo Brain Microdialysis (rats)
- ▢ Brain Penetration (rats & mice tissue and steady-state)
- ▢ In-vivo Metabolism (rats & mice)
- ▢ CV Safety Pharmacology (rats and guineapigs)

Example: Managing a Drug Development Project



Speed & Flexibility

- ▢ Drug & Metabolite Assay Method (Development & Validation)
- ▢ Animal Pharmacokinetics (rats & mice)
- ▢ Human Pharmacokinetics & Bioanalytical support for Phase-I studies
- ▢ Pre-Clinical & Clinical Bioanalysis
- ▢ Protein Binding (in-vitro, in-vivo mice, rats and human)
- ▢ Human Bioavailability & Bioequivalence
- ▢ In-vitro Cytotoxicity (Hep G2 & HEK cell lines)

Contract Research & Manufacturing



- └ **Biotechnology/Fermentation**
 - State-of-the-art cGMP facility
 - WHO GMP certified
 - Certificate of suitability from EDQM for Pseudo-ephedrine HCL
 - In-house engineering capabilities to minimize down times and costs of upgradation and expansion

- └ **Chemical Entities**
 - Chiral chemistry
 - Speciality chemistry, e.g. steroids, β -lactams, etc.
 - Hazardous Chemistry, e.g. halogenations, nitrations, cyanations, lithiations, etc.
 - Synthesis of natural products
 - Organometallic reactions, low temperature synthesis
 - Special Purpose reactions, e.g. hydroformylations, caronylations, hydrogenations
 - Milligram to more than 100 MT level
 - Production under international standards, GMP/Non-GMP
 - R&D units, pilot plant, steroid plant, production plant
 - Advanced quality control, e.g. NMR, LCMS, HPLC, GC, FTIR, etc.

Active Pharma Ingredients & Intermediates



- AZT; Zidovudine EP III (3'-Azido-3'-dioxymidine)	- Omeprazol
- Thymidine (Beta Thymidine)	- Papavene
- Stavudine (2',3'-didehydro-3'deoxythymidine)	- Phentolamine
- 2-Deoxy-N-phenylglucosylamine	- Sildenafil
- 2-Deoxy-D-ribose	- Solanesol, 90-95 %
- Progesterone,	- Sumatriptan
- Mifepristone & related steroids	- Zidovudine
- Prostaglandins	- Reserpine
- Methylphenidate: Recemate	- 10-Deacetyl baccatin III(10-DAB III)
- Methylphenidate: Optically Active	- Camptothecin
- Sertraline	- Calcium Sennoside,20%,
- Fluoxetine	- Colchicine
- Clozapin	- Colchicoside
- Losartan	- Bicalutamide
- Valsartan	- Camptothecin / Irinotecan intermediates and analogs

General and US DMF (Drug Master Files) available

(Disclaimer: Patent and other regulatory restrictions may apply for certain products in some countries)

- Confidential -

Personal Care (Cosmetics) (1)



- **Gliadin from wheat (Protein)**
 - Chemical Name: Single chained protein (MFCD00131160)
 - Description: Hair & skin grooming agent
 - CAS Number: 9007-90-3
 - EC Number: 232-707-7

- **Nordihydroguaiaretic Acid (NDGA), Synthetic**
 - Chemical Name : 1,2-Benzenediol,4,4'-(2,3-dimethyl-1,4-butaneyl)bis
 - Description : Antioxidant (for skin care)
 - CAS Number : 500-39-9
 - EINECS Number : 207-903-0

- **Zinc Pyrithione**
 - Chemical Name: Zinc-2-pyridinethiol-1-oxide
 - Description: Anti dandruff
 - CAS Number: 13463-41-7
 - EINECS Number: 23 66 713

Personal Care (Cosmetics) (2)



- **Benzophenone-3**
 - Chemical Name: 2-Hydroxy-4-methoxybenzophenone
 - Description: UVA II/UVB sun protection agent
 - CAS Number: 131-57-7
 - EINECS Number: 205-031-5
- **Benzophenone-4**
 - Chemical Name: 2-Hydroxy-4-methoxybenzophenone-5- sulfonic acid
 - Description: UVA/UVB sun protection agent
 - CAS Number : 4065-45-6
 - EINECS Number : 225-936-9
- **Calcium Glycerophosphate**
 - Description: Dental enamel protectant (& Food Additive)
 - CAS Number : 27214-00-2

Food & Pharmaceutical Colorants



- └ Tartrazine
- └ Sunset Yellow
- └ Carmosine
- └ Ponceau 4R
- └ Amaranth
- └ Erythrosine
- └ Brilliant Blue FCF
- └ Indigo Carmine
- └ Green S
- └ Quinoline Yellow
- └ Allura Red
- └ Chocolate Brown HAT
- └ Patent Blue V
- └ Etc.

Natural Health Products (Nutraceuticals)



- ▢ **Apigenin:**
 - Chemistry: Flavonoid
 - CAS Registry No. 520-36-5
 - Description 5,7,4'-trihydroxy-flavone.
 - Application: Super-Natural-Nutrient claimed to possess chemopreventive activity against UV-radiation & DNA oxidative damage.

- ▢ **Luteolin:**
 - Chemistry: Flavonoid
 - CAS Number: 491-70-3
 - Description: 5,7,3',4'-tetrahydroxy-flavone.
 - Application: Super-Natural-Nutrient, claimed to have antioxidant, anti-inflammatory, anti-allergic, anticancer, and immune-modulating properties to suppress hyperactive immune systems.

- ▢ **Neem based products:**
 - Chemistry: Azadirachtin (Tetranortriterpenoid)
 - CAS Number: 11141-17-6
 - Application: Phytochemical Pesticides for Organic Foods

- ▢ **Herbal extracts**



MCA Technologies GmbH (Switzerland)

Dr. B. L. Kaul, CEO

Supporting R&D and Business Development
in the Life Sciences Industry

Contact:

MCA Technologies GmbH

Dr. B.L. Kaul

P.O.Box

Bruckackerstrasse 48
4105 Biel-Benken

Phone: +41 (0)61 7218880

Email: kaul@mcatechnologies.com