



BIO-MODELING SYSTEMS

The R&D Booster for Life Science Discoveries

The leading Heuristic Systems Biology Company

COMPANY PROFILE:

- BMSYSTEMS is the first and to date the only Integrative Systems Biology Company that succeeded to create in-silico heuristic models validated in-vivo. These CADI*™ outputs led to discoveries, patents, or operational businesses through its innovative business model, in the fields of infectious diseases, neurology, psychiatry, oncology and industrial biotech.
- BMSYSTEMS creates new knowledge from raw information through the construction of CADI*™ models and,
- BMSYSTEMS generates real & attractive business from this new knowledge through its innovative business model.

CADI*™ MODELS VALUE PROPOSITIONS:

- Disease understanding / redefinition.
- New therapeutic strategies
- New associations of existing molecules.
- Identification/selection of pertinent predictive Biomarkers.
- R&D programs evaluation.
- Drug (re)positioning /(re)profiling/ rescue.
- Proteins "improvements" engine (TAPE) for next generation antibodies, enzymes, and long peptides
- Proposition of new bioproduction processes through microorganisms' modifications.

MARKETS

- Pharma – Biotech - Cosmetics: BMSystems improves success-rate of pharma R&D through the direct exploitation of its experimentally validated predictive CADI™ models in the fields of infectious diseases, neurology, psychiatry, oncology.
- Energy - Chemicals - Environment: BMSystems applies its know-how to « industrial biotech »
- Biodefense – Biosecurity: BMSystems addresses bacterial, viral and toxins threats through Pherecydes-Pharma its first spin-off.

*CADI™: Computer Assisted Deductive Integration

DOMAINS	CADI™ PROGRAMS
CNS / Peripheral Nervous System	Neurodegenerative (Creutzfeldt-Jakob ² , Alzheimer ¹) diseases, Psychiatric disorders ⁵ , Pain ⁵ , Migraine ⁵ , Multiple Sclerosis ⁵ , Fibromyalgia ⁵
Oncology	Breast cancer ³ , Tamoxifen resistance ³ , Metastasis ²
Infection / Immunology	Antibacterial bio-agent ⁴ , Hepatitis C ² , CFS (Chronic Fatigue Syndrome) ¹
Tissue differentiation	Adipocytes growth control ⁵ , Müllerian regression ²
Metabolism	Hypercholesterolemia ⁵ , Metabolic Syndrome ⁵
Industrial biotech	Program Synthons ² : leading Industrial biotech collaborative R&D platform
Proteins diversification engine	CADI™-TAPE Process ³ to improve antibodies, enzymes, long peptides etc..
Nanobiotech, Phages	Pherecydes-Pharma ⁴ , BMSystems' spin-off, Nano-biotechnologies & nano-devices through phage genetic engineering.

1: Models ready for experimental evaluation; 2: Experimentally validated models;
3: Experimentally validated and published models; 4: Experimentally validated and industrially exploited; 5: Proto-Models (positive feasibility study).

UPCOMING HIGHLIGHTS

- Development of TheraNexus, our second spin-off with CEA Life Sciences focused on medical treatments in the field of psychiatric disorders.
- Launch of Pherecydes-Pharma phase I/II clinical trial in multi-resistance bacterial infections and its second round of financing.
- Signature of the second CADI™ program in the context of the " 5 years CADI™ research collaboration".
- Launch of a collaborative research program on psychiatric disorders with the Max Planck Institute of Psychiatry in Munich.
- Signature of a new competitive program in the fields of green chemicals.

RECENT HIGHLIGHTS

- Signature of a "5 years CADI™ research collaboration" with a world leading company in the field of skin care and dermatology.
- Fifth publication with the Max Planck Institute of Psychiatry in Pharmaco-Psychiatry publications.
- Successful 1st round of financing for Pherecydes-Pharma that raised 1.15 M€ and received 500 k€ from the French innovation Agency
- "Bio-IT World Best Practices Award" from the Cambridge Healthtech Institute.
- Third patent filed with Pherecydes-Pharma on phage engineering for nanotech applications.

BMSYSTEMS PUBLICATIONS

CADI™ Models published in prestigious peer-reviewed journals:

- 2011: CNS PSYCHIATRY: Pharmacology Psychiatry publication: Proteome-Based Pathway Modelling of Psychiatric Disorders. Publication with The Max Planck Institute of Psychiatry in Munich
- 2010: INFECTIOUS DISEASES: Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science :Genetically Engineered Virulent Phage Banks in the Detection and Control of Emergent Pathogenic Bacteria. Publication with Pherecydes-Pharma.
- 2009, TISSUE DIFFERENTIATION: Médecine & Sciences: Müllerian duct regression explanation. Integrative systems biology & experimental Biology. Publication with CNRS experimental data.
- 2005, CANCER: Journal of molecular Endocrinology: Integrative analysis of gene expression patterns predicts specific modulations of defined cell functions by estrogen and Tamoxifen in MCF7 breast cancer cells. Publication in collaboration with INSERM unit 553.
- 2003, CANCER: Nucleic Acids Research: Integrated transcriptome analysis of the cellular mechanisms associated with Ha-ras-dependent malignant transformation of the human breast epithelial MCF7 cell line. Publication in collaboration with INSERM unit 553. World first. First in-silico model of a complex human disease validated in-vitro and published.

BMSYSTEMS VALUE PRODUCTION

BMSystems Technologies and know-how (non confidential extract):

- Computer-Assisted Deductive Integration (CADI™) proprietary methodologies and tools. CADI™ Search(data acquisition & mining), CADI™ Architect (data organization & structuring),CADI™ Fiber-N (integrative engine), CADI™ View (model representation & visualization).
- TAPE Patent: WO/2008/093010- December 2006. A technology allowing to rapidly & simultaneously introduce defined densities of random mutations in any number of selected regions within a gene while conserving intact any number of defined coding domains in this same gene (applicable to all proteins, including antibodies, enzymes, etc..).
- AB-ACCUS patent: WO/2008/093009 - December 2006. A recombination technology allowing the rapid & efficient production of phage banks in which every individual differs from all others for any number of selected genes or other sequences.
- RlPh patent: PCT/FR2010/050796 – May 2009. A methodology allowing to reversibly immobilize an obligate lytic phage within its bacterial host and to then extensively modify its genome without adversely affecting the phage's replicative ability.
- CNS patent: WO/2010/029131 - September, 2008 (psychiatric disorders). Dose reduction: use of anti-connexin agents for modulating the therapeutic effect of psychotropic drugs and preclinical evaluation platform patent, filed with CEA Life Sciences
- Pherecydes-Pharma, first operational spin-off in Biodefense/Biosecurity (infectious threats),
- TheraNexus, second therapeutic spin-off under incubation in psychiatric disorders
- 2 bacterial strains under development for "Synthons" program, the major industrial biotech collaborative R&D program in France,
- Contracts with Pharma, cosmetic, chemical companies (confidential).

COMPANY INFORMATION

- Creation: August 4, 2004, profitable since 2006
- Number of employees: Currently: 24, and 100 professionals working as partners on BMSystems programmes and projects
- Private Company, 100% owned by its founders (no search for external investors)
- Member of BIO (Biotechnologies Industry Organization) and MEDICEN Cluster.
- BMSystems' spin-off: www.pherecydes-pharma.com

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