CELLVAX®

Drug Validation Expertise

COMPANY PROFILE

2018

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1. Cellvax Presentation

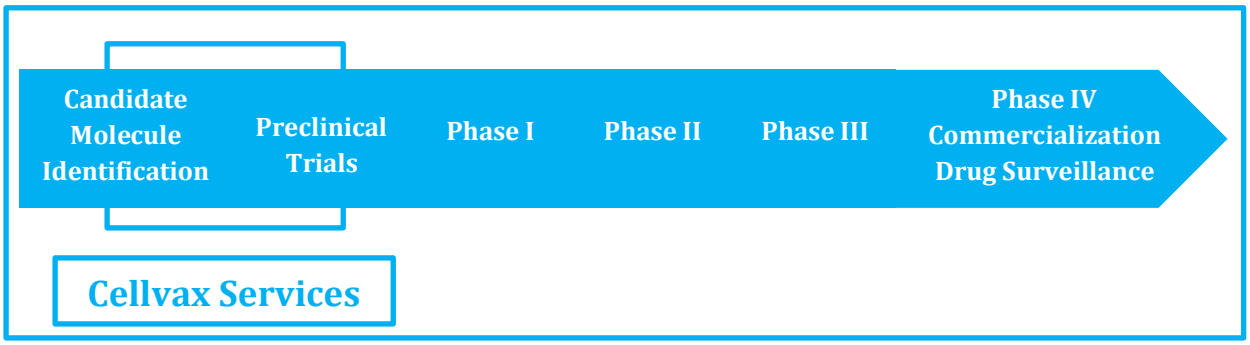
Cellvax, founded in 2001, is a French preclinical CRO which provides complete innovating drug validation studies both *in vitro* and *in vivo* allowing to accelerate the drug development process for unmet needs related to severe human diseases, mainly in Cancer, Diabetes and Osteoarthritis (OA).

Oncology	Diabetes	Osteoarthritis
Leading cause of death worldwide	**Huge market with continuous growth**	**Affecting large number of population**
- Test in vitro; -Primary Tumor cells; -Nodule syste; Animal models, S.C, orthotopic tumor models; -Metastasis; Angiogenesis.	**-Elisa Test (Glucose, insulin); -Diet-induced animal models; -Chemical-induced animal models; -Genetic-induced animal models.**	**-Animal models; -Induced OA, ACLT model; -Spontaneous OA model.**

Toxicology, PK/PD, Biomarkers and other customized models

Today, Cellvax directly employs motivated and differently skilled scientists and engineers, working in interdisciplinary teams on several innovative products.

Cellvax positioning in drug discovery process:



Our services allow speeding up the development of your drug candidates, valorizing drug potential and decreasing the cost of your drug development.

2. Cellvax History

Year	Event
2001	**Foundation of Cellvax**
2006	**French Government Grant OSEO**
2007	**First Eureka Project (Cancer Field)**
2015	**New facility allowing multiple animal models**
2015	**Eurostars Program (Breast Cancer)**
2015	**Official Partner with Biobanques INSERM**
2016	**EURONANOMED projects in cancer and OA fields**
2016	**6 large EU Grants and 2 large French Grants Bpifrance**
2017	**Eurostars Project (Cancer)**

3. Management team

Dr. Mingxing WEI
Founder and Chief Executive Officer

Ph.D. in molecular and cellular biology, University of Lyon I. HDR University Paris XIII. Researcher at « Harvard Medical School », USA. Training Officer in animal experimentation in France. Marketing & Finance training. Head of project in Biotech.

Pr. Michel CREPIN
Co-founder

Ph.D. Professor University Paris XIII. Director of "Institut d'oncologie cellulaire et moléculaire humaine" (1987-1995). Director of university laboratory EA445 (1995 – 2000). Director of INSERM team (U553), Saint-Louis hospital, Paris (since 2000).

Dr. Christian SCHATZ
Co-founder

MD, Doctor of Pharmacy, Ph.D., HDR University of Strasbourg, Aptitude certificate in enterprise administration. Medical director, former member of executive committee of Transgène.

Mr. Olivier-Noël MARTIN
Co-founder

Graduate of E.S.C.P. & DECS (1969), President of General Biscuit / Danone USA, President of KAYSERBERG society. He has created and sold to GLAXOSMITHKLINE in 2002 the STERILYO laboratories. Investment in 6 start-up "biotech".

4. Cellvax Preclinical Studies Services

➢ Anti-proliferative tests in vitro

Cellvax proposes in their services to realize different tests *in vitro* on established cell lines or primary cultures: anti-proliferative tests, PK study, cell cycle, apoptosis, etc.

➢ Animal cancer models

Cellvax propose not only *subcutaneous* tumor models but also original orthotopic tumor models in animal in which we induce lung cancer, colon cancer, pancreas cancer, prostate cancer, breast cancer, gastric cancer, brain tumor, leukemia.

➢ Angiogenic tests in vitro & in vivo

Angiogenesis plays an important role in the tumoral development. Cellvax proposes pro or anti-angiogenic tests. An in vivo original model is also available and consists on a Matrigel implantation in mouse and on a measure of the drug candidates' effects on the microvessels formation.

➢ Tumoral invasion tests in vitro

Cellvax proposes *in vitro* tests which allow measuring the anti-metastatic potential of drug candidates. These techniques allow studying the intravasation and extravasation potentials of tumor cells through endothelium.

➢ Orthotopic tumor models

Cellvax proposes to realise orthotopic models for drug validation studies in breast cancer, colon cancer, lung cancer, pancreas cancer, kidney cancer, prostate cancer, melanoma, glioblastoma, etc.

➢ Syngeneic tumor models in animals

It is extremely usual to employ syngeneic immuno-competent animal tumor models for the preclinical evaluation of test agents. For this purpose, Cellvax have developed different syngeneic tumor models for Leukemia, Melanoma, Bladder cancer, Prostate cancer, Pancreatic tumor, Kidney cancer, Fibrosarcoma, Breast Cancer, Brain tumor, Colon cancer, Pancreatic tumor, Mastocytoma, Hepatic Cancer, Lung cancer.

➢ Original drug-resistant tumor models in vitro & in vivo

Intrinsic or acquired tumor-mediated drug resistance is a major clinical problem that can result in the lack of tumor response to chemotherapy. In order to continuously improve the quality and the originality of Cellvax's oncology services, we have successfully established several drug-resistant tumor models: lung cancer, pancreatic tumor, ovary cancer, etc.

➢ In vivo imaging in alive animals

For these studies, we can propose several imaging technologies: PET Scan, Scanner, X-ray, MRI, Bioluminescence. The new technology, PET (Positron Emission Tomography) Scan, by labeling with 18FDG (Fluoro-Deoxy-d-Glucose), allows to observe phenomenon (micro-metastasis formation, drug bio-distribution, etc) in the same alive animal at different time points without sacrificing animals.

➢ Primary tumor cells

Testing your promising compounds by using human primary tumor cells is the closest way to the real clinical situation. These data would be very useful for your future clinical trials. The established tumor cell lines, after numerous passages in vitro, might lose their initial biological characteristics. In contrast, these primary tumor cells (freshly established from human biopsies) conserve these biological characteristics and could be an ideal tool in anti-cancer studies.

➢ More relevant tumor models

Direct implantation of human tumor biopsies in mice

- To reconstitute tumor micro-environment;
- To be as close as possible to human tumors;
- Tumors are maintained from mice to mice, without using cell culture system.

Non-rodent cancer models, spontaneous tumors

➢ Osteoarthritis animal models

For this disease, Cellvax can propose two types of animal models:

Induced Osteoarthritis (OA) Animal Models:

- Anterior Cruciate Ligament Transection (ACLT) in rabbits, rats, dogs...;
- Meniscectomy;
- Patellectomy;
- Immobilization;
- Ovariectomy: Postmenopausal OA;
- Enzymatic / chemically induced OA;
- Others.

Spontaneous Osteoarthritis (OA) Animal Models:

- Mouse (DBA/1, STR/ORT, C57BL/6, C57);
- Guinea pig (Hartley, Duncan-Hartley);
- Others.

➢ Toxicity studies in vivo

A complete toxicity experiment can be proposed at Cellvax in both rodent and non-rodents:

- Acute toxicity in mice, animals;
- Sub-acute toxicity in animals;
- Chronic toxicity in animals;
- MTD (Maximum Tolerated Dose) with single dose and/or repeated doses;
- "Abnormal toxicity" in two animal species according to European guidelines;
- Complete blood count (CBC). (Total blood analysis: Red cells; White cells; Platelets; Hemoglobin) and Chemistry profile (Alanine aminotransferase (ALT); Aspartate aminotransferase (AST); Alkaline phosphatase (ALP); Creatinine kinase; Glucose);
- Monitoring: animal body weight, behavior, eventual death;
- Hematological and biochemical analysis;
- Macroscopic observation and histological analysis on main organs.

➢ Bio-distribution and PK studies in vivo

In order to understand the pharmacokinetics (PK) of your innovating drugs, we propose a bio-distribution and PK studies in mice, rats, beagle dogs, mini-pigs. At different time points (Typical time points: 30 Min; 1h; 3h; 6h; 12h; 24h; 32h; 48h and 96h), the presence of your drug or its metabolites will be searched and analyzed in different organs (Liver; Spleen; Lung; Heart; Brain; Intestine; Adipose tissues; Skin; Bone; Serum; Urine, etc.).

➢ Mechanisms of actions studies

- Topoisomerases I & II, required during DNA replication, transcription and homologous recombination;
- Cell cycle analysis Cells, stained with BrdU (Bromodeoxyuridin) and IP (iodide propidium);
- Specific biomarkers by ICH Proliferation marker, Ki-67; angiogenesis marker, CD-31, T cell infiltrations in tumors (CD4+ or CD8+), hypoxia, etc.;

- Apoptosis analysis: Cells labeled with Annexin V and IP. Double-stained cells analyzed by FACScan;
- ELISA tests;
- Western blot analysis;
- Enzymes assays.

➢ Complete histological analysis and/or with experts' interpretations

- Tissues fixation in 4% Formalin;
- Frozen tissues;
- Paraffin-embedded or frozen sections;
- H&E and/or immuno-staining.

➢ Other specific studies upon request

Cellvax is also able to provide customized studies according to your specific needs in order to fully satisfy the specific needs of our customers.

HSV-1 and HSV-2 infection models in mice.

Diabetic models:

- In vitro models;
- In vivo model for Type I diabetes;
- In vivo model for Type II diabetes.

Parkinson diseases:

- In vitro models;
- In vivo models.

Ascite production:

Ascite production in mice by administration of the incomplete Freund's adjuvant.

5. Collaboration and Business Development

The will to collaborate

Cellvax is a preclinical service company with strong expertise mainly in Oncology and Osteoarthritis fields. Our interactive collaborations allow accelerating the development of your drug candidates.

Cellvax has a strong will to collaborate with public laboratories, biotech and/or with pharmaceutical companies which develop novel compounds. These collaborations could be very enriching and will allow speeding up the development of drug candidates.

Partnering strategy

Cellvax is also seeking to establish close collaboration and/or partnership to develop or co-develop innovating compounds with a greater speed and less cost.

6. Why contact us?

- Expertise of our founder and operational teams;
- Complementary and extensive biological tests;
- Reactivity and efficiency of services;
- Confidentiality and experimental procedures with Quality Insurance manager;
- State of the art animal facility with rodents and non-rodents;
- Access to a network of public and private laboratories;
- Continuous improvement of our tests in order to be more competitive;
- Our services allow to speed up the development of your drug candidates;
- Our services allow to valorize drug potential in several pathologies;
- Our services allow decreasing your cost of drug development;
- Support of external marketing;
- A “Window” company or a local partner in France and in Europe.

7. Contact Information

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