June 2009

News letter of CBS n°6

CBS Incubator : New local in construction

International Symposium on Biotechnology (4th-8th, May, 2008)

Scientific file:

Antibiotics save lives, we must save antibiotics!

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EDITO

Benchmarking is a continuous and systematic evaluation of products, services and methods against those of the most serious competitors and organizations recognized as leaders, for the sake of improvement.
Not only is it an analytical method for calibration based on the best practices, but it can also be considered as a state of mind and a style of management.
The principle consists in comparing different objective or subjective quantifiable criteria with rules that can be made to have the same analysis systems by the various members who will conduct the study.
The aim is to determine the criteria by which we need to perfect in order to reach the optimum
This managerial practice seems to be appropriate to the CBS, which began a process of self-evaluation and a comparison of its performance indicators in September 2006. It is therefore appropriate to formalize this approach in a pilot Benchmarking applied to the CBS. .
In this context, we first identified the performance indicators for the benchmarking corresponding to the CBS main activities. We restricted our study to the analysis of 5 indicators, 2 related to Research (Number of publications / year and Number of European projects) and 3 to valorisation (Number of agreements with industrials; Number of patents and Number of created start-up in the incubator)
Then, we selected the best national and international competitors corresponding to the pre-defined indicators.
Thereafter, we conducted an analysis of the collected results in order to identify the Variance causes and to plan future performance levels for the next 5 years.
The results of our analysis using benchmarking showed that the CBS is able to adopt other measures involving new criteria. To reach the future performance levels in the CBS described above, the following recommendations have been suggested:
- Recruitment of two researchers / year
- Organization of regular seminars
- Creation of a technology transfer service
- Creation of an intellectual property service
- Extension of the incubator capacity

Finally, it was recommended to the General Directorate of the CBS to appoint a person responsible for implementation, monitoring and readjustment of the action plan which role would be to:
• Instruct the CBS staff that Benchmarking is rather a way to work better than working more.
• Ensure good understanding and application of benchmarking results by the CBS staff.
• Have a successful communication with the CBS staff.
• Integrate the results of an ongoing benchmarking in the process of the implementation of an action plan. Should there be a derivation from the goals, the manager must do the appropriate adjustments.

International Symposium on Biotechnology (4th- 8th May, 2008)

The International symposium on Biotechnology "ISB 2008 was held in Sfax between 4th and 8th May 2008. This event was organized by the Centre of Biotechnology of Sfax **"CBS"** under the patronage of the Ministry of Higher Education, Scientific Research and Technology, in collaboration with the following institutions:

The international Center of Genetic Engineering and Biotechnology **"ICGEB"** the University of Sfax **"US"** and The Tunisian Union for Industry, Commerce and Handicrafts **"UTICA".**

The main objectives of this symposium were to promote the creation and dissemination of rapidly growing knowledge in the different biotechnology areas covered on this occasion and to allow to senior and junior scientists from all over the world to meet in Tunisia.

In this context, three topics and six satellite sessions were planed:

- **Topic 1 (Biotechnology for human health)**
- **Topic 2 (Microbial and Environmental Biotechnology)**
- **Topic 3 (Agricultural, Food and Marine Biotechnology)**
- **Satellite Session1:** Innovative Biotechnology (European Project PROMEMBRANE)
- **Satellite Session2:** Biosafety and Quality management in Biotechnology laboratories
- **Satellite Session3:** Advances in hearing sciences: from functional genomics to therapies (European Project EUROHEAR)
- **Satellite Session 4:** Sesame a treasure of healthy benefits (with agro food industrials)
- **Satellite Session 5:** Developments for biotechnological research: success stories and networking
- **Satellite Session 6 :** Incubating innovations (Start-ups and Spin-offs): From opportunities to innovative companies.

This unique event gathered more than **700** attendees from 40 different countries. Thirty international invited speakers**;** 220 foreign participants**;** 35 participants from satellite sessions**;** 40 sponsors and exhibitors and 400 Tunisian participants have participated in this outstanding event.

The opening ceremony was chaired by the secretary of State in charge of the scientific research in Tunisia, the president of the University of Sfax, the President of the UTICA and the representative of the ICGEB director general.

We would like to certify that our real pride was actually the important number of received congratulations testifying to the successful organization and the excellent scientific level of this event.

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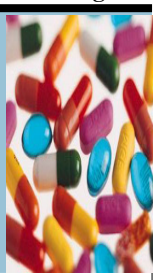
Antibiotics save lives, we must save antibiotics!



Generalities and History

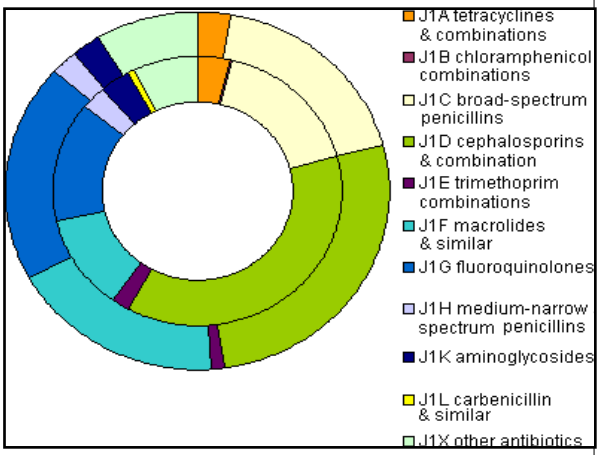
Antibiotics are natural substances produced by microorganisms, or obtained either by semi-synthesis or total chemical synthesis used in very low concentrations to treat infections. The term antibiotic was originally used to describe only antibacterial treatments. Actually, this term can also apply to substances that affect fungi, prions, worms and some tumor cells. Generally, the antibiotics are not effective in viral infections but recently, some antibiotics have been used for viral infections for example against HIV and HCV.

Antibiotics can be classified in several ways: according to their action against the infecting organisms. Another method classifies antibiotics according to the type of bacterial strains they affect. Antibiotics are also classified on the basis of their chemical structure. This latter way is the most useful and several classes of antibiotics can be distinguished as b-lactams chemically characterized by a b-lactam ring, with the substructure groups penicillins, cephalosporins, carbapenems, monobactams, nocardicins and clavulanic acid; chloramphenicol, a nitro benzene derivative of dichloroacetic acid; glycopeptides, they consist of glycosylated cyclic or polycyclic nonribosomal peptides; macrolides, macrocyclic lactones; and others.

More than 3000 years ago, ancient people stumbled over the discovery that some moulds could be used as a cure. The Egyptians, the Chinese, and Central American Indians would use moulds to treat infected wounds. In 1846, the Hungarian doctor *Ignaz Phillip Semmelweis* emitted the asepsis notion. 1860, *Louis Pasteur* showed that many diseases were caused by bacteria. *Joubet* (1877), *Pasteur* (1878) and *Vuillemin* (1889) observed that some microorganisms can inhibit others. In 1928, the microbiologist *Alexander Fleming* observed that a plate culture of *Staphylococcus* had been contaminated by the *Penicillium notatum*, and that the growth of bacteria adjacent to this *Penicillium* was inhibited. Curious, *Fleming* grew this *Penicillium* in a pure culture and found that it produced a substance that killed a number of pathogenic bacteria. Naming the substance penicillin, Dr. *Fleming* published the results of his investigations, in 1929, noting that his discovery might have therapeutic value if it could be produced in quantity. This miraculous observation was at the origin of one of the biggest revolutions of the medical world by the opening of the antibiotics era.

Production and Utilizations

In 1939, the American microbiologist Rene Dubos purified the first antibiotic from a culture of a *Bacillus* bacterium that he named typrothicin. This realisation allows to Florey and Chain to purify the Penicillin G and to produce this antibiotic (1940) at commercial quantities making penicillin G the first successful antibiotic for human bacterial infections treatments. In 1943, Waksman isolated the antibiotic streptomycin from the actinomycete bacteria *Streptomyces griseus*. This American microbiologist isolated and developed many other antibiotics such as neomycin purified from a culture of *Streptomyces fradiae*. Since, several antibiotics have been isolated from microorganisms fungi and bacteria especially from the actinomycete bacteria belonging to the genus *Streptomyces* which produces over two-thirds of the clinically useful antibiotics of natural origin **[1]**. With the discovery of antibiotics, humanity has had a very effective remedy against the pathogenic bacteria and therefore, the antibiotics industry has registered a spectacular evolution. The application and demand for antibiotics increased rapidly after their discovery and in order to meet these demands, biotechnology has taken the place of the traditional techniques.



Antibiotic audited sales, 2003 outside ring, 1994 inside (IMS: International Medical Statistics)

In fact, antibiotics are produced industrially by a process of fermentation, where the source microorganism is grown in large fermentors (100.000-150.000 liters or more) containing a liquid growth medium. Oxygen concentration, temperature, pH and nutrient levels must be optimal, and are closely monitored and adjusted automatically. As antibiotics are secondary metabolites, the microorganism concentration must be controlled very carefully. To obtain the antibiotic from the fermentation broth as a pure active molecule, several extractions, separations and purifications steps are applied to the supernatant cells free.

Contrarily to what is commonly believed, antibiotics are not solely used in human medicine. There are many application domains of these miracle drugs:

* Animal therapy, besides the use of antibiotics in veterinary medecine, it has been demonstrated that the addition of low doses of antibiotics to animal feeding leads to the increase of the growth rate which results in a decrease of the production costs

* Plants pathology, Nearly 40 antibiotics were screened for plant disease control. The most commonly used are oxytetracycline and streptomycin against the fire blight pathogenic bacterium Erwinia amylovora.

* Scientific research, antibiotics contribute very efficiently to the development of the scientific research. In fact, they are used to prevent microorganism contaminations during eukaryotic cell cultures, to understand the cellular mechanisms of genes expressions and cells multiplication, and en the construction of mutants and recombinant cells, etc.

The industrial production of antibiotics depends on the market demand. In 2008, the global antimicrobial therapeutic market was $24 billion with 14 products recording sales of more than $1 billion **[2]**. The three antibacterial market leaders were: Zosyn ((piperacillin and tazobactam) is an antibacterial combination product consisting of the semisynthetic antibiotic piperacillin sodium and the β-lactamase inhibitor tazobactam sodium; Floxin and Cravit, two antibiotics belonging to the fluoroquinolone class **[2]**.

Problems and Solutions

For approximately 40 years (1950 – 1990), antibiotics have been used and considered as a miracle way to combat pathogenic bacteria. Unfortunately, the last two decades were characterized by f the resistance of pathogenic bacteria to several commonly used antibiotics. Bacteria have proven to be much more innovative and adaptive than we imagined and havd developed resistance to antibiotics at an ever increasing pace. Factors that contribute to antibiotics resistance are:

* Misuse and overuse of antibiotics in humans, animals and agriculture
* Demand for antibiotics when antibiotics are not appropriate
* Failure to finish an antibiotic prescription
* Sale of antibiotics without a prescription in some countries

Antibiotics resistance in bacteria may be an inherent trait of the organism that renders it naturally resistant, or it may be acquired by means of mutation in its own DNA or acquisition of resistance genes by vertical and horizontal transfers. There are at least three possible mechanisms (transduction, transformation and conjugation) for horizontal antibiotics resistance transfers between bacteria.

Let's be realistic, it is impossible to stop antibiotic resistance altogether. Resistance is a natural consequence of adaptation, an inherent factor in the evolution of pathogenic bacteria. Antibiotic resistance is a broad-based problem that involves not just patients and doctors in clinical settings, but also solutions that concern a range of federal and state agencies, international governments and organizations, consumer, scientific and professional groups and individuals.

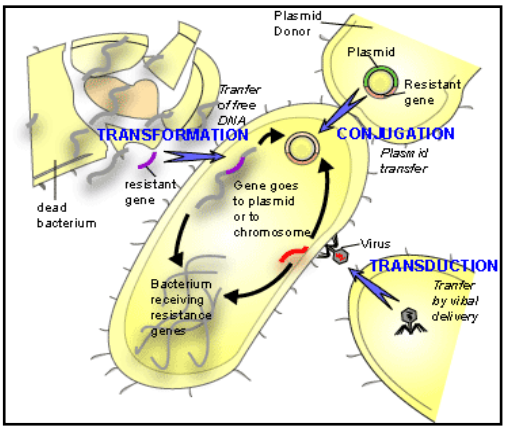
Actually, besides the problem of finding new antibiotics to fight old diseases (because resistant strains of bacteria have emerged), we are facing the challenge of finding new antibiotics to emerging diseases.

To find new antibiotics, some measures must be taken such as:

* Establish a prudent practice of antibiotics in all different areas
* Rapid identification of the pathogenic bacterium responsible of the infection before antibiotic prescription.
* Encouraging the use of antibiotics with narrow spectrum and optimization of doses and durations of treatment
* Establishing a global network of epidemiological observation to develop adequate measures of hygiene.

Besides these precautions and actions, scientific research should work on finding new antibiotics from natural sources (microorganisms and plants), and on strengthening the use of the combinatorial chemistry techniques to obtain new semi-synthetic antibiotics, to go deeper into the comprehension of the cellular and molecular mechanisms of bacteria in order to identify new targets for the antibiotics. Equally, we must develop the molecular tools of *Streptomyces* bacteria to produce new hybrid antibiotics by genetic engineering.

Within this scope and since 1998, one of the research activities of the Laboratory of Enzymes and Metabolites of Prokaryotes (LEMP) of the Center of Biotechnology of Sfax (CBS), has been oriented towards the search for new bioactive molecules from microorganisms especially from bacteria belonging to the *Streptomyces* genus. Until now, several hundred of actinomycetes bacteria have been isolated from different uncommon Tunisian habitats and then selected for their capacity to produce bioactive molecules. About fifty bacteria were selected for advanced studies. Twenty of these bacteria were identified. There were new bacteria belonging to the genus *Streptomyces*. The culture conditions of these identified bacteria were optimized for optimal bioactive molecules production. Approximately forty biomolecules were extracted and purified from semi-preparative cultures of the few identified new bacteria. The corresponding chemical structures were determined via different spectroscopic techniques. These biomolecules, which belong to different classes of antibiotics, possess several biological activities such as, antibacterial, antifungal and antitumors. Moreover, it should be noted that currently, genetic engineering procedures are being increasingly used to improve antibiotics production and to produce novel hybrid active molecules from *Streptomyces* bacteria. To do so, it is necessary to construct a genes library of biosynthetic pathways and ensure the successful transformation of the studied strains. The problem is that numerous interesting *Streptomyces* species have not proven to be transformable. In our Laboratory we have developed new efficient transformation procedures for *Streptomyces* species **[3]** and we are in progress for the construction of a genes library of the biosynthesis pathways of two interesting bioactive molecules.



Mechanisms of horizontal antibiotics resistance genes transfer in bacteria

[1]: *Kieser et al., (2000). Practical Streptomyces Genetics (2nd ed.). Norwich, England: John Innes Foundation.*

[2]: Global Antiviral/Antibiotics Market Review 2008 (World Top Ten Antimicrobial Agents)

[3]: Mellouli et al., (2004). Efficient Transformation Procedure of a Newly Isolated *Streptomyces* sp. US58 strain Producing Antibacterial Activities. *Current Microbiology* **49. V6:** 400-406.

CBS ECHOS

CBS always dynamic has increased its participation in fairs and events:

►The 7th session of the salon of Mediterranean agriculture and food industries "SMA-Med Food 2008",
Sfax, 20 - 24 May 2008.

►The 10th session of the UNIVEXPO organized by The University of Sfax,
Sfax, 07 - 09 July 2008.

►The 5th session of Creativity and Technological Innovation,
Sousse, 28-29 July 2008.

►The first session of business creation salon,
Tunis, 17-18 October 2008

►The Fiftieth Anniversary of the Tunisian University,
Tunis, 11-12 November 2008

SCIENTIFIC EVENTS

6 conferences were organized in the framework of the activities of competency development service:

►« Forum sur le projet de PURATREAT » (06 -10 -2008) **Mr. RD Tyagi**

►« L'apoptose chez la levure médiée par la P 53 humaine : mise en évidence et exploitations potentielles » (20 - 10 -2008) **Pr. Ali Gargouri**

►« Variations génomiques et maladies complexes : qu'a-t-on appris et quelles orientations pour le futur » (03-11 - 2008) **Dr. Ahmed Rebaï**

►« Bio-production : du développement à la création de l'entreprise » (18- 11 - 2008) **Pr. Nabil Zouari**

►«Hormone-dependent transcriptional regulation associated with tomato fruit development: a case of signalling cross-talk » (02 - 12 - 2008) **Pr. Mondher Bouzayen**

►« Aspects on the production and formulation of potential biocontrol agents » (13 -01-2009) **Dr. Stephan Dietrich**

2 workshops were organized in the CBS with the collaboration of several institutions:

►«Méthodes bioinformatiques pour l'étude des polymorphismes génétiques »

Organizing institutions: CBS and Société Tunisienne d'Immunologie

Date :12-15 November 2008

► «Les Start-up en Biotechnologie : comment réduire le gap ? »

Organizing institutions: CBS, Agence Universitaire de la Francophonie AUF, Laboratoire de Biotechnologie de l'Environnement, Narbonne, Institut de Recherche pour le Développement, la Région PACA et la Chambre de commerce et de l'industrie de Sfax – Tunis

Date :11 -12-2008

THESIS

►**Sonia Jemli :** Etude biochimique et moléculaire d'une activité cyclodextrine glycosyl transférase d'intérêt industriel **ENIS: Thèse en Génie Biologique (2008).**

►**Dorra Ayadi-Zouari :** Expression et sécrétion de protéines recombinantes chez les *Procaryotes* **ENIS : Thèse en Génie Biologique (2008).**

►**Lilia Fourati ben Fguira :** Souches de *Streptomyces* nouvellement isolées et productrices d'activités antifongiques: Identification des souches, purification et caractérisation des molécules actives et clonage de gènes impliqués dans les voies de biosynthèse. **FSS : Nouvelle thèse en Biologie (2008).**

►**Samiha Sioud:** Détection et analyse moléculaire de gène de voies de biosynthese d'un dérivé dicétopipérazine et de deux molécules de la famille des rhamnopyranosides produite par deux nouvelles bactérie du genre *Streptomyces*. **ENIS : Thèse en Génie Biologique (2008).**

►**Hèla Trigui-Lahiani :** Clonage de gènes de pectinases fongiques et essais d'identification du facteur de régulation spécifique des pectinases chez *penicillium occitanis*. **Thèse en Génie Biologique ENIS (2008).**

►**Houda Boussarsar :** Application de traitement thermique et enzymatique de solubilisation et saccharification de la fraction hémicellulosique en vue de la valorisation de la bagasse de canne à sucre. **Nouvelle thèse en cotutelle soutenue à Reims-France (2008).**

►**Kaouthar Makni** : Doctorat en Génie biologique intitulé : Etude Epidemiologique et Génétique du Diabète de Type 2 et de sa Complication Rénale**(2008).**

►**Boutheina Hadhri-Guiga :** Titre : Analyse moléculaire des gènes P53 et BNLF1 dans le cancer du nasopharynx et Expression dans *E.coli* des différents variants de la LMP1 (**2008)**.

►**Jaouhar Mourali :** Titre ALK : un nouveau récepteur à dépendance. Etude des mécanismes de son effet pro-apoptotique (**2008).**

PUBLICATIONS

► **BRINI F., AMARA I., FEKI K., HANIN M., KHOUDI H.AND MASMOUDI K**. "Physiological and Molecular analysis of seedlings of two Tunisian durum wheat (*Triticum turgidum* L. subsp. *Durum* [Desf.]) varieties showing contrasting tolerance to salt stress." **Acta Physiologia Plantarum** 31(1): 145-154. **IF 1,6**

►**KHARRAT N., AL'FADHLI S., REBAÏ A**. "Screening and validation of dinucleotide repeats in intron 1 of the human EGFR gene and its paralog in the HER2 gene". ***J Recept Signal Transduct Res.*** 28:475-483. **IF 1,8**

►**JUNG WOO-JIN., MABOOD F., SOULEIMANOV A., ZHOU X., JAOUA S., KAMOUN F, AND SMITH DONALD L** «Stability and Antibacterial Activity of Bacteriocins Produced by *Bacillus thuringiensis* and *Bacillus thuringiensis* ssp. kurstaki».***J. Microbiol. Biotechnol****. 18, 1836-40.****IF 2,4***

► **YACOUBI HADJ AMOR I., SMAOUI K.,CHAABÈNE I., DJEMAL L., MABROUK I., ELLEUCH H., ALLOUCHE M., MOK-DAD-GARGOURI R, AND GARGOURI A** "Human p53 induces *apoptosis and dowregulates Thioredoxin expression* in *Saccharomyces cerevisiae".* ***FEMS Yeast Research (8) 1254-1262. IF=2.812***

►**KAMMOUN R., NAILI B. AND BEJAR S. "**Application of a statistical design to the optimization of parameters and culture medium for a-amylase production by *Aspergillus oryzae* CBS 819.72 grown ongruel (wheat grinding by-product)". **Bioresources Technology** 99(13):5602-5609 **IF 3, 1**

►**GRANIER C., MAKNI K., MOLINA L., JARDIN-WATELET B., AYADI H, AND JARRAYA F**. « Gene and protein markers of diabetic nephropathy".**Nephrol Dial Transplant** (3):792-9. PMID: 18065784, **IF 3,1**

► **PHAM MINH D., GALLEZOT P., AZABOU S., SAYADI S, AND BESSON M** "Catalytic wet air oxidation of olive oil mill effluents: 4. Treatment and detoxification of real effluents". **Applied Catalysis B: Environmental**, 84 (3-4): 749-757. **IF 4,6**

► **MABROUK I1., BUART S1,2., HASMIM M2., MICHIELS C 1 .,CONNAULT E 3., OPOLON P3., CHIOCCHIA G 4., LEVI-STRAUSS M 1 .,CHOUAIB S,2, AND KARRAY S 1,2,*:"**Prevention of Autoimmunity and Control of Recall Response to Exogenous Antigen by Fas Death Receptor Ligand Expression on T Cells". **Immunity 29, 1–12. IF=19.266**

Mutations of LRTOMT, a fusion gene with alternative reading frames, cause nonsyndromic deafness in humans

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Many proteins necessary for sound transduction have been identified through positional cloning of genes that cause deafness1–3. We report here that mutations of LRTOMT are associated with profound nonsyndromic hearing loss at the DFNB63 locus on human chromosome 11q13.3–q13.4. LRTOMT has two alternative reading frames and encodes two different proteins, LRTOMT1 and LRTOMT2, detected by protein blot analyses. LRTOMT2 is a putative methyltransferase. During evolution, new transcripts can arise through partial or complete coalescence of genes4. We provide evidence that in the primate lineage LRTOMT evolved from the fusion of two neighboring ancestral genes, which exist as separate genes (Lrrc51 and Tomt) in rodents.

Received 9 April; accepted 28 August; published online 26 October 2008; doi:10.1038/ng.245

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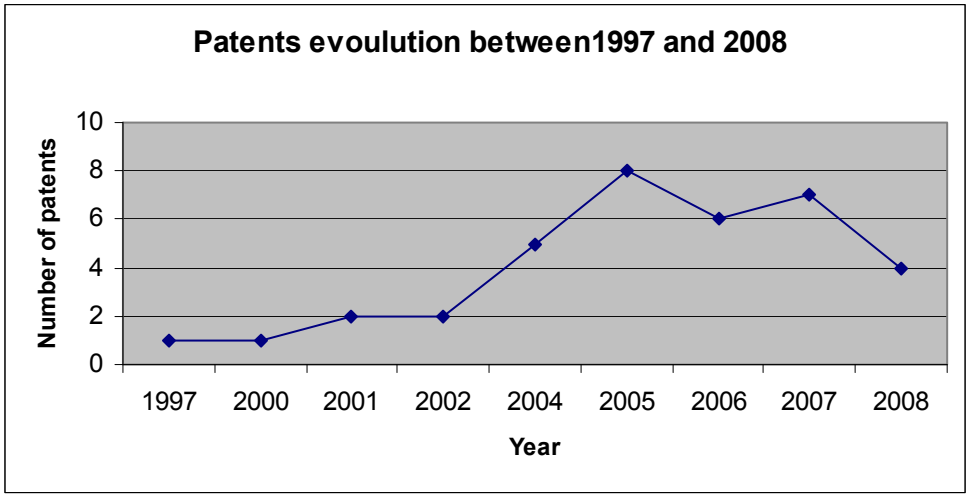
INTELLECTUAL PROPERTIES

►Elleuch L., Smaoui S., Chaaban M A., Fourati Ben Fguira L., Chaaban K.A., Karray Rebai I., Bejar S, and Melouli I. « Treize molécules biologiquement actives, dont une nouvelle dérivée d'ester, ayant des intérêts thérapeutiques, agricoles et agro-alimentaires, produites simultanément à partir d'une nouvelle souche bactérienne appelée *Streptomyces* sp » SN08473 (2008)

►Yacoubi-Hadj Amor I., Zribi E., Smaoui K., Fattouch S., Mabrouk I., Djemal L., Dardouri D., Mokdad R ,and Gargouri A. « Utilisation de la levure experimant la P53 pour la recherche de molécules anti –apoptose. » SN08367(2008)

►Skouri-Gargouri H ,and Gargouri A. « Peptide antifongique thermostable secrété par une souche locale du champignon filamenteux *Aspergillus clavatus*. » SN08392 (2008)

►Jaoua S., Zribi Zghal R., Belguith-Ben Hassen N., Jemaa M. AND Azzouz H. « Un nouveau bioinsecticide d'une souche tunisienne (BUPM98) de Bacillus thuringiensis israelensis constitué de nouvelles delta-endotoxines fortement actives sur les larves d'insectes appartenant à la famille des diptères et vecteurs de maladies. » SN 8193 (2008)



36 patents since 1997 including

5 international patents

VISIT OF THE SECRETARY OF STATE TO THE MINISTER OF HIGHER EDUCATION, SCIENTIFIC RESEARCH ANDTECHNOLOGY

Mr. Ridha Ben Mosbah, Secretary of the State to the Minister of Higher Education, Scientific Research and Technology, visited on February, 15, 2008 the 2nd installment of CBS, and he chaired a meeting with researchers and CBS students on research opportunities and employment of young researchers.

REASEARCH COOPERATION

AT NATIONAL LEVEL

►COOPERATION AGREEMENT BETWEEN THE CBS AND THE OLIVE INSTITUTE OF SFAX (JULY 2008) FOR A 3 YEAR PERIOD

Both parties agreed to exchange competences in the domains of research and trainings and to collaborate in organizing joint scientific events

AT INTERNATIONAL LEVEL

►AGREEMENT FOR ACADEMIC EXCHANGES, COOPERATION AND RESEARCH BETWEEN THE CBS AND THE DEPARTMENT OF BIOLOGICAL SCIENCES , UNIVERSITY OF QATAR

(MARCH 2008) FOR A 5 YEAR PERIOD

This agreement or Memorandum Of Understanding “MOU” has been signed 2008 between the CBS and the University of Qatar. It has been followed by a Subcontract for Substansive Programmic Work whichhas entered into effect on May, 7th,2008 through a signing ceremony organized during the International Symposium on Biotechnology held between the 4th and 8th of May 2008. We have currently Four (4) joint running projects as direct applications to the above mentioned MOU related to Health, Molecular Biology and Agriculture fields.

►COOPERATION AGREEMENT BETWEEN THE CBS AND THE BIOLNDUSTRY PARK CANAVESE-ITALY (JULY 2008) FOR A 3 YEAR PERIOD .

Both parties agreed to encourage and promote cooperation in the fields of creation and animation of a Biolcluster, management of a Science Park, Business development, incubation and support to start-ups, spin-off, technology transfer and valorization of scientific results, technology development and services to new emerging biotechnology companies through this Cooperation Agreement.

►COOPERATION AGREEMENT BETWEEN THE CBS AND THE CENTER OF BIOTECHNOLOGY LIBYA (MAY 2008)

Both parties agreed to collaborate jointly in the domain of analysis of biological substances and the exchange of technical staff between the two parties. In this context, we already have one running application with the Targets for Diagnosis and Therapy Unit.

SOCIAL AND CULTURAL ACTIVITIES

The CBS policy gives a great interest to organize social activities at the occasion of eminent events.

Planting at the occasion of The Fiftieth Anniversary of the Tunisian University

Celebrating Aid el Fitr and Aid el Adha

CBS Incubator:
"Track your project from the idea to realisation"

The CBS will have a business incubator specialized in biotechnology; this incubator will be directly related to the general direction and supported by a steering committee composed of 12 members representing all the concerned Tunisian administrations.

It will be a place where good ideas of biotechnology researchers may materialize in innovative start-ups, which during their early years, may find the necessary tools to function and to grow.

Many services will be offered by the incubator, freeing young creators from expensive costs:

- Building
- Advice: training ensured by eminent experts....
- Administrative facilities: reception, meeting room,...
- Computing: Internet
- Environment: cleaning and security of premises, maintenance of green spaces, parking...



Currently four innovative companies are incubated in the CBS structures and have access to the CBS equipments :

S.e.D.D.

sedd.tn@gmail.com

SeDD: Services Environnement & Développement Durable:

- Applied research and development.
- Development for environmental technologies.
- Engineering and consultancy services.
- Control and impact studies.

dmitstat@gmail.com

DMIT: Data Mining and information technology:

- Personalized solutions for academic: statistical studies statistical and bioinformatics analysis of medical theses, doctoral thesis, articles and scientific reports and personalized training program.
- Solutions for companies : Personalized training for technical personnel in computer, statistical software and analysis of all types of data companies.

biotech_rdp@yahoo.fr

BIOtech^{RDP}: Research, Development and Production:

- Perform veterinary diagnosis analyses.
- Perform training in immunological techniques.
- Develop on order specific antibodies.
- Develop ready to use kits, based on antibody production, for veterinary diagnosis applications.

BioServ Laboratories
Promoting animal and human food

bioservlaboratories@gmail.fr

BioServ Laboratories:

- Production of food additives.
- Food Analysis.
- Valorization of by-products plants and animals.

These start-ups will move to the new incubator building at the end of this year and will benefit of a dynamic environment at the top of the biotechnology sector.

News letter of CBS n°6

Redaction Committee

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Special thanks to
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