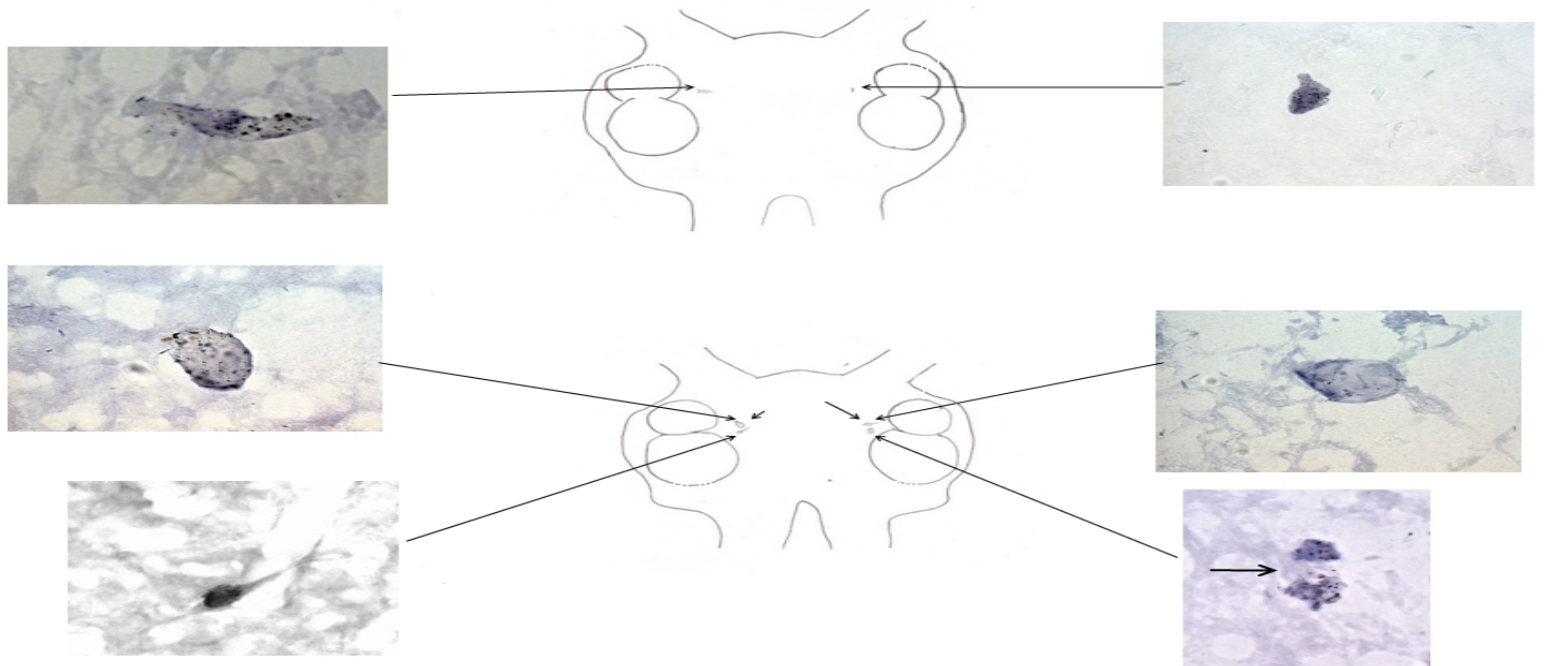


# International Biotechnology Color Journal

A Scientific Peer Reviewed Journal with Focus on BIOTECHNOLOGY  
and Covering Its Many Hues, Tints, Tones & Shades



Regular issue:  
mRNA PDH expression in the brain of crayfish  
*Procambarus clarkii*

Produced and hosted by *Centro de Investigación Científica de Yucatán, A.C.*,  
in collaboration with *Universidad Nacional Autónoma de México*,  
and the *International Foundation for Biotechnology Research & Early Stimulation in the Culture of Health, Nutrition, Sport,  
Art, Science, Technology & Society*  
Int. biotechnol. color j., ISSN 2226-0404

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The International Biotechnology Color Journal appears every 4 months in the last week of February, June and October of each year, starting in October 2011. It is a non-profitable Electronic Publication. In its initial phase it does not require neither publication nor access fees. Its goal is the publication of Original Scientific Information, previously unpublished, and provided by the contributing authors out of its own will. *Int. biotechnol. color j.*, ISSN 2226-0404.

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## The INTERNATIONAL BIOTECHNOLOGY COLOR JOURNAL (IBCJ)

is the official quarterly publication of the **International Foundation for Biotechnology Research & Early Stimulation in the Culture of Health, Nutrition, Sport, Art, Science, Technology & Society A.C.** (IFBR&ESCHNSAST&S).

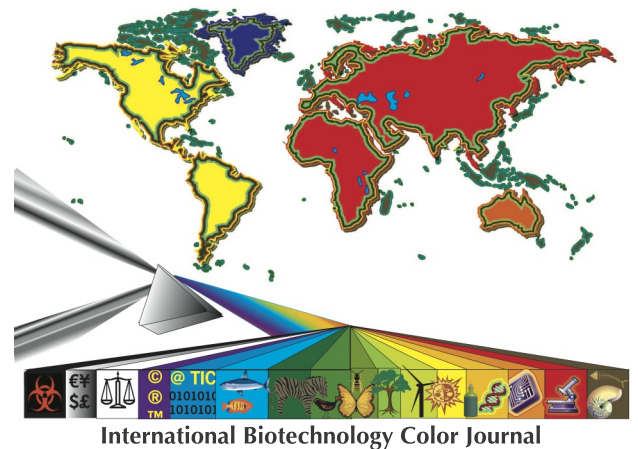
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Its main goal is to help bringing together efficient biotechnological solutions for many human problems, with the need for environmentally friendly and sustainable processes.

As means to such goal, the Foundation counts on education to create social awareness to biotechnology's benefits and risks, and to promote the formation of highly qualified professionals and research scientists.

The constitutive act of the foundation was signed in the Heroic City of *Huajuapán de León, Oaxaca*, on September 14<sup>th</sup>, 2009, at the *NOTARÍA PÚBLICA No. 61 de los ESTADOS UNIDOS MEXICANOS*. As .

Susana Lozano Muñiz  
President of the Foundation



The International Biotechnology Color Journal is produced and Hosted by Centro de Investigación Científica de Yucatán, A.C., Calle 43 No. 130, Colonia Chuburná de Hidalgo. Mérida Yuc., Mexico. Tel: (+52) 999 942 8330. Fax: (+52) 999 942 3900. RFC. CIC791116770.

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## Editorial section

International Biotechnology Color Journal (IB CJ) is an electronic Open Access journal, devoted to the publication of peer-reviewed articles covering all the fields of biotechnology.

With this number we celebrate our first year of publication with main focus on the dissemination of scientific peer reviewed papers. In addition ICBJ intent is to provide a forum for reviews of special interest, notes presenting relevant findings in a short format, essays with new technical advances or relevant updates of reported protocols, book reviews, scientific meetings, and letters to the editor. The present issue offers a sample of such diversity.

Instructions for every type of contribution are presented in the journal's Homepage and at the end of the present issue. The Editorial Board of IBCJ is fully committed to publish novel contributions in all areas of biotechnology. Submissions are reviewed from a rigorous optic of scientific criticism and all original contributions within the scope of the journal are welcomed.

If you are interested in participating as reviewer, please send us a letter, and a CV stressing your experience in the filed. Send this information by e-mail to "Dr. Jose Juan Zúñiga Aguilar" <[zuniga@cicy.mx](mailto:zuniga@cicy.mx)>

## Editorial comments to the contents of this issue

By José Juan Zúñiga-Aguilar, Chief editor.

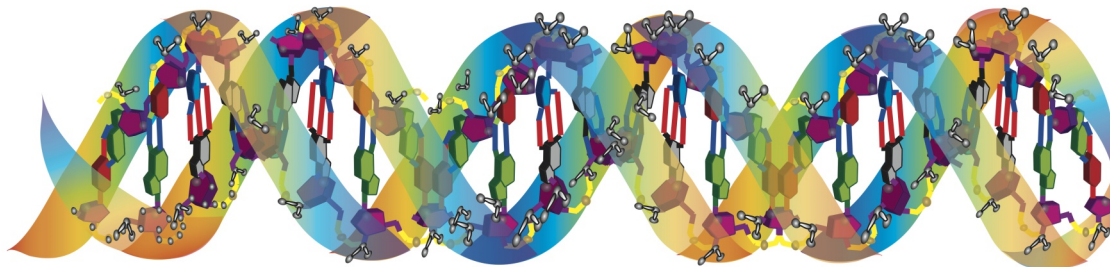
In this issue, Porras-Villalobos *et al.* cloned a cDNA segment of a pigment-dispersing hormone (PDH) beta isoform from the brain of the crayfish *Procambarus clarkii*. PDH peptides from many crustaceans have been isolated and characterized, but information about their gene expression is scarce. The authors presented here an interesting studio whose results about the spatial and temporal expression of the  $\beta$ -PDH isoform support its role as a key element of the circadian clock of crustaceans.

In the second contribution, the president of the "International Foundation for Biotechnology Research & Early Stimulation in the Culture of Health, Nutrition, Sport, Art, Science, Technology & Society A. C.", Dra. Susana Lozano-Muñiz, presents the report of the Biotechnology Summit 2012, which was organized at the City of Merida, Yucatan. With special relevance, she informs that the Best Poster Presentation Awards was granted as recognition of the quality of the students' work currently developed in biotechnology. Winner groups are working in different but strategic topics exposing a broad area of interests either in medicine, biofuels or in vitro tissue culture, which represent a clear sample of the diversity of themes exposed in the congress.

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# International Biotechnology Color Journal

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Regular Issue, October 2012

Editorial Board:

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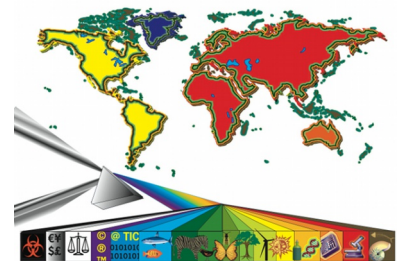
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## IMPORTANT



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# Identification of neurons expressing mRNA of pigment-dispersing hormone (PDH) in the brain of the crayfish *Procambarus clarkii*

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Chief Editor: José J. Zúñiga-Aguilar. Area Editor: Dr. Diego González Casati. Received: june 15, 2012. Revised version: september 30, 2012. Accepted: October 17, 2012 .

## ABSTRACT

The expression of pigment-dispersing hormones (PDHs) have been reported in some crustaceans, however information on the nature of the genes and transcripts is limited. In this work we report the cloning of a portion of a messenger RNA encoding the isoform  $\beta$ -PDH, as well as the expression of this transcript in ten to eleven somata localized in the brain of the crayfish *Procambarus clarkii*, and the variations in 24 h of brain transcript expression. This  $\beta$ -PDH isoform is homologous to that found originally in the eyestalks of the crab *Uca pugilator*.

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**Abbreviations:** PDH, Pigment dispersing hormone; PDFs, Pigment dispersing factors; ISH, In situ-hybridization; DIG, Digoxigenin; ERG, electroretinogram

**Key words:** crustacean, crayfish, mRNA, brain, eyestalk.

## INTRODUCTION

The Pigment-dispersing hormone (PDH) is a key element in the circadian clock machinery of invertebrates. In crustaceans PDHs function as humoral promoters of tegument pigment migration (1,2); they are also proposed to be multifunctional peptides acting as local neurotransmitters/modulators (3,4). In insects, PDH peptides known as Pigment-dispersing factors (PDFs), having been identified in neurons exhibiting circadian variations; they have been proposed as central pacemakers (5,6).

The hormone PDH was initially isolated from eyestalks of shrimp *Pandalus borealis* (7), ( $\alpha$ -PDH, NSGMINSILGIPRVMTEA-amide). In 1985, Rao and co-workers purified PDH from eyestalks of fiddler crab *Uca pugilator* ( $\beta$ -PDH, NSELINSILGLPKVMNDA-amide); the classic crab isoform called  $\beta$ -Pigment dispersing hormone ( $\beta$ -PDH) (2). Since that time, all known crustacean PDH isoforms once purified or cloned from the eyestalk of crabs (2,7,8,9,10), crayfish (1,11), shrimp (12,13), or lobster (14).

The aim of this study was to identify the cells in the brain of *Procambarus clarkii* in which the mRNA PDH is expressed. Therefore, we characterized the mRNA encoding PDH in the brain of *P. clarkii* and used a complementary RNA (cRNA) PDH probe for *In-situ* hybridization (ISH). By real-time RT-PCR, we quantified in one day the level of  $\beta$ -PDH mRNA expression in the brain of crayfish *P. clarkii* at different times during the day. The results presented here show 10 somata in clusters 9 and 11 of *P. clarkii* deutocerebrum expressing  $\beta$ -PDH mRNA. We found a maximum expression of  $\beta$ -PDH mRNA in the brain of *P. clarkii* at 6:00 am (circadian time 0, CT0), and the minimum at 12:00 am (circadian time 18, CT18). Based on the DNA sequence, the inferred amino acid sequence we found in *P. clarkii*'s brain is the same originally found in *U. pugilator* eyestalks ( $\beta$ -PDH NSELINSILGLPKVMNDA-amide), and different from that isolated from *P. clarkii* eyestalk (1) (NSELINSILGLPLVMNEA-amide).

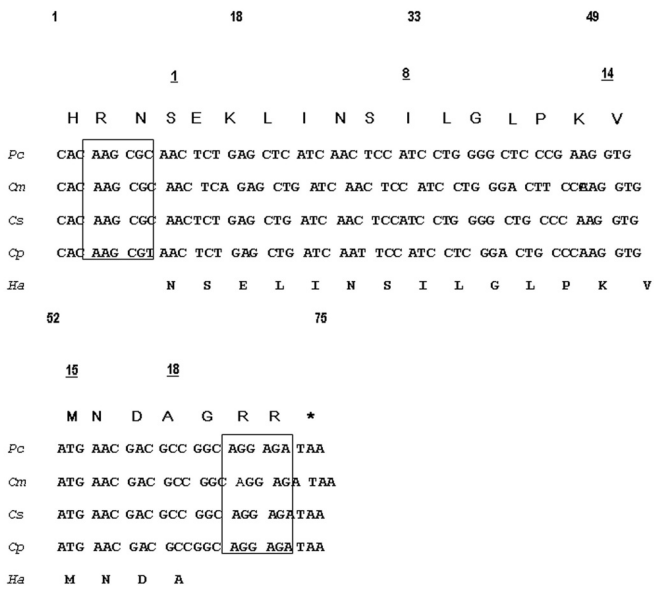
## METHODS

Adult crayfish *P. clarkii* were collected from the Mexican state of Chihuahua. Animals were maintained in an aerated aquarium at a constant temperature (16°C) and under a photoperiodic regime of 12 h of Light and 12 h of Darkness (LD 12:12). To know the Circadian time (CT) of the population, we chose a random sample (five animals) from the crayfish pool and recorded the Electroretinogram (ERG) rhythm of each individual crayfish. For tissue collection, crayfish were anesthetized with packing ice for 10-15 min. For ISH, the brains were isolated by micro-dissection, immediately placed in liquid nitrogen, and 12- $\mu$ m slices of tissue were made.

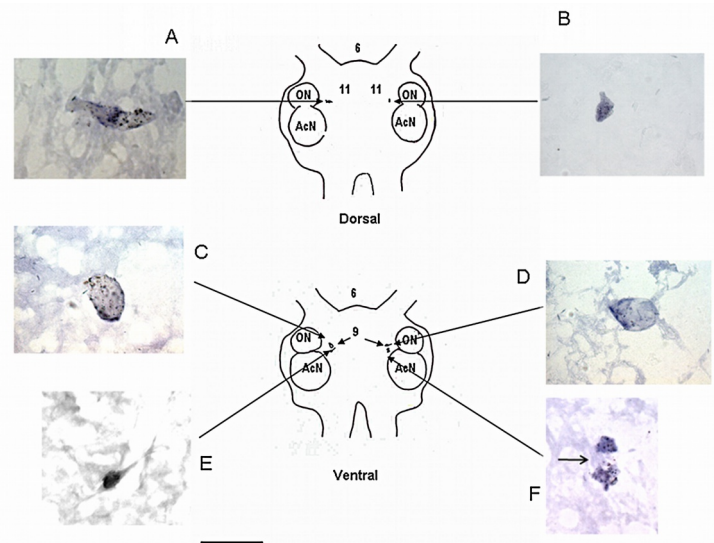
PCR amplification of the cDNA encoding the PDH precursors was performed with cDNA as template, obtained by reverse transcription of total RNA. The degenerated forward PPF-primer (5'-CACAAAGCGCAACTCNGAGC-3') and the degenerated reversed PPR-primer (5'-TTATCTCCBCCGGCVTCG-3') were used. After an initial denaturation step of 5 min at 95°C, the PCR reaction was carried out for 35 cycles with a denaturation step of 30 sec at 95°C, an annealing step for 30 sec at 58°C, and an extension step of 5 min at 72 °C. *In-situ* hybridization (ISH) was performed as described (15).

## RESULTS

A 75 pb predicted amino acid sequence for mRNA-PDH ( $\beta$ -PDH) is shown in the comparative alignment (first sequence, Figure 1) (Accession numbers FJ389457). Probing for PDH encoding mRNA containing cells in the brain of *P. clarkii* by the ISH method is depicted in Figure 2. The label of pdh-DIG probe was restricted to the pericarya and detected in dorsal and ventral regions in the deutocerebrum. According with Sandeman's nomenclature (16) somata were found in clusters 9 and 11. An extended PDH mRNA-DIG signal (~50  $\mu$ m) corresponding to spliced kit three to four somata were found in bilateral-cluster-11 of the dorsal region (Fig 2A); a strong signal was found in a single cell ~20  $\mu$ m localized in the opposite lobe of brain (Fig 2B). When exploring the ventral region of the deutocerebrum, two large PDH mRNA-DIG-labeled ~45  $\mu$ m somata were identified in bilateral cluster 9, (Fig 2C and 2D); a small cell of ~15  $\mu$ m was intensely labeled (Fig 2E). Two



**Figure 1.** Alignment of selected DNA sequences of Pigment- dispersing hormones (PDH)s. Capital letters on top, indicate the predicted amino acids for the DNA sequence; capital letters underneath indicate the amino acids for the sequenced 18aa PDH peptide isolated by High performance liquid chromatography (HPLC) from the American lobster Ha, *Homarus americanus* (20); Pc, *Procambarus clarkii* Accession number FJ389457 (this work); Cm, *Carcinus maenas* (18); Cs, *Callinectes sapidus* (19); Cp, *Cancer productus* (16) Translation stop codons are indicated by an asterisk.



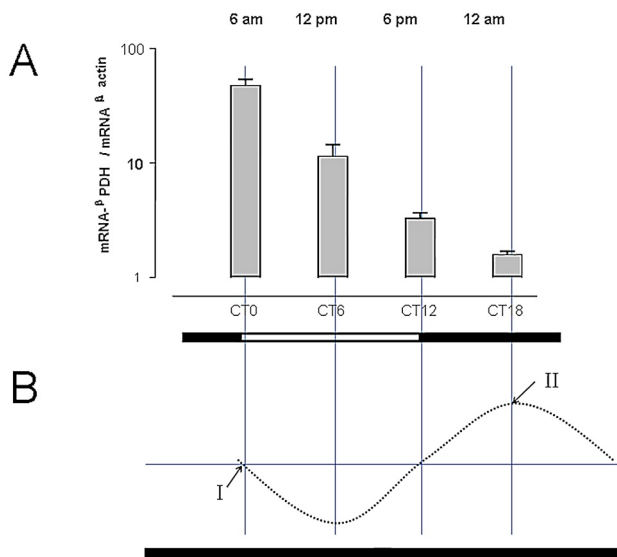
**Figure 2.** *In-situ* hybridization of the dorsal region of the deutocerebrum of *P. clarkii*. The figure shows a sagittal section of *P. clarkii* brain probed with pigment-dispersing hormone (pdh)-Digoxigenin (DIG) which revealed sites of synthesis of PDH messenger RNA (mRNA). A) In dorsal region, cluster of at least four cells showing a strong signal localized proximal to the optical and accessory nuclei. B) In dorsal region a single soma with intense signal proximal to the same nuclei in the opposite anatomical area. In ventral region variable size of somata are located in between the vicinity of optical nucleus (ON) and accessory nucleus (AcN). Numbers 6 and 11 indicate anatomical areas according to Sandeman. ON, Optical nucleus; AcN, Accessory nucleus; Black bar scale is equivalent to 50 μm.

cells containing the PDH encoding mRNA were found in the opposite site close to the optical and accessory nuclei (Fig 2F). Figure 3 exhibits the variations of mRNA-β-PDH expression in the brain measured by real-time RT-PCR in one day. The maximum expression level of the transcript 47.52 (±6.53) was obtained at CT0. Lower mRNA-β-PDH levels 1.58 (±0.24) were obtained at CT18. In Figure 3B, the dotted line displays the circadian variation profile of the ERG determined as previously reported (17). It is observed that the minimum level of mRNA-β-PDH expression detected matches with the maximum amplitude (arrow II) of the ERG, which is dependent on natural oscillations of groups of photoreceptor cells (18). The “middle point” of photoreceptor activity in the eyestalk is given when the ERG recording crosses the X axis (arrow I); this point is in agreement with the mRNA-β-PDH maximum level expression in the brain.

## DISCUSSION

PDH modulates spontaneous electrical activity of the brain and synchronizes EGR in *P. clarkii* (17). By other side, variation in the ERG amplitude in the visual system of *P. clarkii* has been reported (19). On measuring the electrical activity in the brain of this crayfish, some rhythm patterns in spontaneous multiunit activity and visual evoked potentials (VEPs) were found (20) These rhythms are 180° out-of-phase one to another. The rhythm of VEPs showed the main peak at midnight and is in closed phase relationship with the ERG amplitude rhythm (20); in addition, physiologically, this peak in the amplitude of the ERG signifies the highest natural oscillation activity of photoreceptor cells (9). In *P. clarkii* brain, the lowest level of mRNA-PDH synthesis coincides with the midnight peak of the VEPs.





**Figure 3.** Time course of  $\beta$ -Pigment-dispersing hormone ( $\beta$ -PDH) messenger RNA (mRNA) expression in 24-h. A) Graphic shows a determination of transcript concentration by quantitative Polymerase chain reaction (qPCR). The x-axis scale shows the day time (CT) in hours; the y-axis scale shows the ratio between  $\beta$ -PDH vs  $\beta$ -actin mRNA concentration. B) Graphic of variation profile of the Electroretinogram (ERG) in eyestalk photoreceptors of *P. clarkii*. The dotted line shows ERG minimum amplitude at CT6 and ERG maximum amplitude at time CT18 measured in synchronized animals to 12:12h light/dark condition cycle for 5 weeks prior to the experiments. The x-axis scale black bar shows time in hours and the dark light condition when the experiment was performed; the y-axis scale shows the ERG amplitude in  $\mu$ V. Arrow I indicates ERG amplitude at maximum  $\beta$ -PDH expression while arrow II indicates the maximum ERG amplitude at minimum  $\beta$ -PDH expression.

## CONCLUSION

In *P. clarkii*, the mRNA-PDH-expressing cells identified may be considered as molecular substrate of a circadian control system (oscillatory pacemakers) with PDH acting as a rhythm transmitter to distal brain areas and eyestalks in the crayfish. Electrophysiological study might provide evidence for neurons in *P. clarkii* deutocerebral area that produce an isoform of PDH, may constitute circadian oscillators of *P. clarkii* brain.

## ACKNOWLEDGMENTS

This work was partially financed by Cinvestav, Unidad Zacatenco, Mexico City, México. We are grateful the help of Biol. Alberto Piña-Escobedo, B.Sc.Biol., in preparation of reagents, for the aid of Mr. Rodrigo García-Gutiérrez in technical assistance, and the help of Ms. Antonia López-Salazar in clerical assistance.

## REFERENCES

1. McCallum ML, Rao KR, Riehm JP, Mohrher CJ, Morgan WT (1991) Primary structure and relative potency of an analog of the beta-PDH (pigment-dispersing hormone) from crayfish *Procambarus clarkii*. *Pigment Cell Res.* 4:201-208.
2. Rao KR, Riehm JP, Zahnow CA, Kleinholz LH, Tarr GE, Johnson L, Norton S, Landau M, Semmes OJ, Sattelberg RM, Jorenby WH, Hintz MF (1985) Characterization of a pigment dispersing hormone in the eyestalk of the fiddler crab *Uca pugnator*. *Proc. Natl. Acad. Sci. U S A.* 680:5319-5322.
3. Verde MA, Barriga-Montoya C, Fuentes-Pardo B (2007) Pigment dispersing hormone generates a circadian response to light in crayfish, *Procambarus clarkii*. *Comp. Biochem. Phys. Part A* 147:983-992.
4. Sullivan JM, Genco MC, Marlow ED, Benton JL, Beltz BS, Sandeman DC (2009) Brain photoreceptor pathways contributing to circadian rhythmicity in crayfish. *Chronobiol. Int.* 26:1136-1168.
5. Helfrich-Förster C (1995) The periodic clock genes expressed in central nervous system neurons which also produce a neuropeptide that reveals the projections of the circadian pacemaker cells within the brain of *Drosophila melanogaster*. *Proc. Natl. Acad. Sci. U S A.* 92:12-16.
6. Yoshii T, Wülbeck C, Sehadova H, Valeri S, Bichler D, Stanewsky R, Helfrich-Förster C (2009) The neuropeptide pigment-dispersing factor adjust period and phase of *Drosophila's* clock. *J. Neurosci.* 29:2597-2610.
7. Fernlund P (1976) Structure of a light-adapting hormone from the shrimp, *Pandalus borealis*. *Biochem. Biophys. Acta* 439:17-25.
8. Hsu YA, Stemmler EA, Messinger DI, Dickinson PS, Christie AE, de la Iglesia HO (2008) Cloning and differential expression of two  $\beta$ -Pigment-Dispersing Hormone ( $\beta$ -PDH) isoforms in the crab *Cancer productus*: evidence for authentic  $\beta$ -PDH as local neurotransmitter and  $\beta$ -PDH II as a humoral factor. *J. Comp. Neurol.* 508:197-211.
9. Klein JM, Mohrher CJ, Sleutels F, Riehm JP, Rao KR (1994) Molecular cloning of the two pigment-dispersing hormone (PDH) precursors in the blue crab *Callinectes sapidus* reveals a novel member of the PDH neuropeptide family. *Biochem. Res. Comm.* 205:410-416.
10. Ma M, Bors EK, Dickinson ES, Kwiatkowski MA, Sousa GL, Henry RP, Smith CM, Towle DW, Christie AE, Li L (2009) Characterization of the *Carcinus maenas* neuropeptidome by mass spectrometry and functional genomics. *Gen. Comp. Endocrinol.*

161:320-334.

11. **Kleijn DPV, Linck B, Klein JM, Weidemann WM, Keller R, Van Herp F** (1993) Structure and localization of mRNA encoding a pigment dispersing hormone (PDH) in the eyestalk of the crayfish *Orconectes limosus*. FEBS 321:251-255.
12. **Desmoucelles-Carette C, Sellos D, Van Wormhoudt A** (1996) Molecular cloning of the precursors of pigment dispersing hormone in crustaceans. Biochem. Biophys. Res. Comm. 221:739-743.
13. **Ohira T, Nagasawa H, Aida K** (2002) Molecular cloning of cDNAs encoding two pigment-dispersing hormones and two corresponding genes from the kumura prawn (*Penaeus japonicus*). Mar. Biotechnol. 4:463-470.
14. **Fu Q, Goy M.F, Li L** (2005). Identification of neuropeptides of decapod crustacean sinus gland using nanoscale liquid chromatography tandem mass spectrometry. Biochem. Biophys. Res. Comm. 337:765-778.
15. **Pinaud R, Mello CV, Velho TA, Wynne RD, Tremere LA** (2008) Detection of two mRNA species at single-cell resolution by double-fluorescence *in situ* hybridization. Nat. Protocols, 3: 1370-1379.
16. **Sandeman D, Sandemas R, Derby C, Schmidt M** (1992) Morphology of the brain of crayfish, crabs, and spiny lobsters: a common nomenclature for homologous structures. Biol. Bull. 183:304-326.
17. **Solis-Chagoyán H, Alvarado R, Figueroa A, Mendoza-Vargas L, Fuentes-Pardo B** (2012) Pigment dispersing hormone modulates spontaneous electrical activity of the cerebroid ganglion and synchronizes electroretinogram circadian rhythm in the crayfish *Procambarus clarkii*. Comp Biochem Physiol A Mol Integr Physiol. 161:450-455.
18. **Fuentes-Pardo B, Hernández-Falcón J** (1993) Neurobiology of the circadian clock of crayfish. Trends Comp. Biochem. Physiol. 1:635-673.
19. **Aréchiga H, Fuentes-Pardo B, Barrera B** (1973) Circadian rhythm of responsiveness in the visual system of the crayfish. In: Neurobiology of Invertebrates (ed. J. Salanki), pp 403-421. Budapest: Publishing House of the Hungarian Academy of Sciences.
20. **Hernández HO, Fuentes-Pardo B** (2001) Cerebroid ganglion is the presumptive pacemaker of the circadian rhythm of electrical response to light in the crayfish. Biol. Rhythm Res. 32:125-144.

# BIOTECHNOLOGY SUMMIT, 2012.

## REPORT OF THE EVENT

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## Notes from the President of the Foundation

The Biotechnology summit 2012 (BS12) was the first General Meeting of the International Foundation for Biotechnology Research & Early Stimulation in the Culture of Health, Nutrition, Sport, Art, Science, Technology & Society A.C. a Nonprofit Organization, was scheduled this year for March 12-21 in Mérida Yucatán México. The organizing committee developed an extensive program highlighting not only recent progress in biotechnology, but also the trends in biotechnology for future commercial application. The Biotechnology summit is an event inclusive of all biotechnology-related topics, from issues of bioethics, biotechnology applications in basic and applied research. The areas were color-coded, following the color codes used by the IBCJ.

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## Remarks by the President of the Foundation

We hope that the biotechnology summit 2012 has contributed to the updating, distribution, intercom and improvement of biotechnology and research activities in Mexico and other countries, so as to boost the development and management of communication, collaboration academic and productive. In biotechnology summit 2012 discussion on the grounds and actions aimed at developing new processes, products and benefits for different needs and regions of our country were undertaken. We choose to amalgamate into one place the various areas of application of biotechnology, in order to provide all participants, but especially young biotechnologists, with a forum for the interaction between academic researchers and industry in the field of Biotechnology. The diversity of all areas of biotechnology and sustainable development, viewed from a scientific, technological and productive, made the event a challenge, but also an opportunity.

As highlights of this year's program, the 2012 summit's Biotechnology Scientific Sessions comprised 15 areas/color of biotechnology and its applications, and one core symposium: "Strategies to Monitor and Reduce Resistance to *Bacillus thuringiensis* among Targeted Insects".

## Other Symposia

### *Symposia with Participation of Students*

1. Effect of temperature and protease inhibitors on the proteases of sea cucumber (*Isotichopus fuscus*) (Hernández *et al.*).
2. Pathogenicity of *Isaria fumosorosea* on immature whitefly *Bemisia tabaci* (Hemiptera:Aleyrodidae) (Ruiz *et al.*).

3. Study of the fermentative capacity and ethanol production of two microorganisms isolated from bovine rumen (Estrada-Martínez *et al.*).
4. Morphological, biochemistry and molecular characterization and selection of genotypes with flesh color red orange in *Carica papaya* L. (Vázquez *et al.*).
5. Differential induction and repression patterns of  $\beta$ -fructofuranosidases of *Aspergillus niger* in submerged and immobilized culture (Trenado-Urbe *et al.*).
6. Study of BMP-15 and BMPR-1B Gene Polymorphism in West African Sheep of Yucatán (Cough-Puga *et al.*).

## *Workshops Within the Conference*

1. Somatic embryogenesis and embryo rescue - Preparation and in vitro propagation of disease-free plants.

In charge of Dr. Hector Gonzalez-Rosas, COLPOS.

2. Every Day We Learn Biotechnology

In charge of the National Research and Technology Transfer for Sustainable Rural Development (SNITT) of SAGARPA (Mexican government).

## *Organizers and Participants*

In the organization of the event several committees were involved (Fig. 1). The Organizing Committee, responsible for all the planning, logistics, and communication with the attendees. The Scientific Committee, responsible for the quality of scientific presentations and symposia within the event. The organizers of the individual symposia and workshops and the Meeting staff, in charge of the technical details, and providing help to the attendees.

## Meeting Organizing Committee

<b>Addy Leticia Zara-García</b> (UAC)	<b>Laura Conde-Farraes</b> (UADY)
<b>Arcadio Valdes-González</b> (FCB UANL)	<b>Mario Alberto Dominguez-Magaña</b> (UNPA)
<b>Deepak Bhatnagar</b> (USDA ARS)	<b>Monica Guadalupe Lozano-Contreras</b> (INIFA-Mocochá)
<b>Elizabeth Herrera-Parra</b> (INIFAP Mochochá)	<b>Nohemí del Camen Reyes-Vázquez</b> (CIATEJ Unidad Mérida)
<b>Elizabeth Ortiz-Vázquez</b> (IT Mérida)	<b>Patricia Tamez-Guerra</b> (FCB-UANL)
<b>Eric Dumonteil</b> (CIR-Hideyo Noguchi-UADY)	<b>Rodolfo Quintero-Ramírez</b> (UAM C)
<b>Felipe Vázquez-Flota</b> (CICY)	<b>Sara Elena Solís-Pereira</b> (ITM)
<b>Gerardo Rivera-Muñoz</b> (ITM)	<b>Susana Lozano-Muñiz</b> (UNPA)
<b>Jairo Cristobal-Alejo</b> (Instituto Tecnológico de Conkal)	<b>Victor Manuel Toledo-López</b> (IT Mérida)
<b>Jose Antonio Hernández-Contreras</b> (UNPA)	

## Symposia Organization

<b>Symposium Organizer</b> <b>Patricia Tamez-Guerra</b> (FCB-UANL)	<b>Workshops Organizer:</b> <b>Victor Manuel Toledo-López</b> (ITM) <b>Jose Juan Zuñiga-Aguilar</b> (CICY)
<b>Symposium Co-Organizers</b> <b>Cristina Rodríguez-Padilla</b> (FCB-UANL) <b>Carlos Blanco</b> (USDA-ARS) <b>Brenda Oppert</b> (USDA-ARS)	<b>Monica Guadalupe Lozano-Contreras</b> (INIFA-Mocochá)

## Meeting staff

<b>Karla Daniela Hernández Llanes</b> (SMBBY)	<b>José Martín González Llanes</b> (SMBBY)
<b>María Concepción Gómez Maldonado</b> (SMBBY)	<b>Pedro Pablo Martín Canul</b> (SMBBY)
<b>Delta Rivas Méndez</b> (SMBBY)	<b>Sandy Geobani Burida Chalé</b> (SMBBY)
<b>Yosihey Chan Escalante</b> (SMBBY)	<b>Dánika Citally Garrido Aguilar</b> (SMBBY)
<b>Victor Hugo Sonda Souza</b> (SMBBY)	<b>Jesús Manuel Ramón Sierra</b> (SMBBY)
<b>Roger Calán Contreras</b> (SMBBY)	<b>Ana Leticia Catzim Uc</b> (SMBBY)
<b>Jesus Antonio Pool Chan</b> (SMBBY)	<b>María Gabriela Dziebek</b> (SMBBY)
<b>Roger Nery Calán Contreras</b> (SMBBY)	<b>Guillermo Meza González</b> (SMBBY)
	<b>Irene Lara Martín</b> (SMBBY)

## Scientific Committee

<b>Addy Leticia Zara-García</b> <i>UAC</i>	<b>Ma del Carmen Montes-Horcasitas</b> <i>CINVESTAV-IPN</i>
<b>Alejandro Ruiz-Sánchez</b> <i>FCQ-UNACH</i>	<b>Ma. de los Angeles Sánchez-Contreras</b> <i>CIATEJ AC</i>
<b>Andrés Hernández-García</b> <i>Baylor College of Medicine</i>	<b>Marco Antonio Meraz-Rios</b> <i>CINVESTAV IPN</i>
<b>Antonio Rivera</b> <i>Centro de Inv Micro del ICUAP BUAP</i>	<b>María del Carmen Navarro-Maldonado</b> <i>UAM-Iztapalapa</i>
<b>Aymen Salih</b> <i>UACH</i>	<b>María del Carmen Urzua-Hernandez</b> <i>FQ UNAM</i>
<b>Blanca E Sanchez-Ramirez</b> <i>COL-POS Tab</i>	<b>Martín Ernesto Tiznado-Hernández</b> <i>CIAD AC Sonora</i>
<b>Consuelo del Carmen Bautista-Muñoz</b> <i>West Visayas State University</i>	<b>MaryAnn Principato</b> <i>DT FDA</i>
<b>Cynthia Limsiaco</b> <i>UAM-Iztapalapa</i>	<b>Maximiliano Wilda</b> <i>CONICET</i>
<b>Demetrio Alonso Ambríz-García</b> <i>CIBA IPN</i>	<b>Miriam de la Garza-Ramos</b> <i>FO CDICS UANL</i>
<b>Diana Verónica Cortés-Espinosa</b> <i>National University of San Martín</i>	<b>Monica Rosales-Pérez</b> <i>Asoc Poblana de Cienc Micro AC</i>
<b>Diego Gómez-Casati</b> <i>ITS FCP QR</i>	<b>Muhammad Azhar</b> <i>Microbiologist Islamabad, Pakistan</i>
<b>Diego Ramon Briceño-Domínguez</b> <i>FCQB UAS</i>	<b>Muhammad Ramzan</b> <i>Univ. of Agriculture Faisalabad</i>
<b>Eduardo Armenta-Aldana</b> <i>UAEM</i>	<b>Muhammad Sheraz</b> <i>CLAFLIN</i>
<b>Eiba Villegas-Villarreal</b> <i>UNPA</i>	<b>Naima Cortes-Pérez</b> <i>INRA Centre de Recherche Jouy</i>
<b>Enrique Villalobos-Amador</b> <i>CINVESTAV-IPN</i>	<b>Nelson Eduardo Alvarez-Licona</b> <i>ESM IPN</i>
<b>Fabián Fernández-Luqueño</b> <i>Punjab Medical College, Pakistan</i>	<b>Patricia Tamez-Guerra</b> <i>UFB FCB UANL</i>
<b>Faiz Ahmed Raza</b> <i>Punjab Medical College</i>	<b>Peggy Elizabeth Alvarez-Gutiérrez</b> <i>Univ Polit. Chiapas</i>
<b>Faiz Ahmed-Raza</b> <i>CICY</i>	<b>Prakash Ghimire</b> <i>Tribhuvan University, Kathmandu</i>
<b>Felipe Vázquez-Flota</b> <i>CIBNOR</i>	<b>Rachid Charbel Maroun</b> <i>CNRS UMR/INSERM</i>
<b>Fernando García</b> <i>IPN</i>	<b>Rafael Riosmena-Rodríguez</b> <i>Biología Marina, UABCS</i>
<b>Fernando López-Valdez</b> <i>IQB-ITM</i>	<b>Ricardo Gómez-Flores</b> <i>ENCB IPN</i>
<b>Gerardo Rivera-Muñoz</b> <i>IMSS UIM</i>	<b>Rosalva Mora-Escobedo</b> <i>ITM</i>
<b>Gilma Sánchez-Burgos</b> <i>CICIMAR</i>	<b>Sara Elena Solís-Pereira</b> <i>UAQ</i>
<b>Gustavo Hernández-Carmona</b> <i>Colegio de Posgraduados</i>	<b>Sergio de Jesús Romero-Gómez</b> <i>Medical Micro &amp; Immuno PCOM</i>
<b>Héctor González-Rosas</b> <i>FQ UNAM</i>	<b>Shafik Habal</b> <i>ENCB IPN</i>
<b>Imelda Velázquez-Montes</b> <i>CBG IPN</i>	<b>Silvia Giono-Cerezo</b> <i>CIAD AC Mazatlán</i>
<b>J Luis Hernández-Mendoza</b> <i>UNPA</i>	<b>Sonia A. Soto-Rodríguez</b> <i>PSU</i>
<b>Jacqueline Capataz-Tafur</b> <i>UABCS</i>	<b>Suresh D Sharma</b> <i>Department of Microbiology Univ Illinois</i>
<b>Jose Luis Díaz-De-León-Álvarez</b> <i>INMEGEN</i>	<b>Tamiselvam Batcha</b> <i>FB UV</i>
<b>Laura del Bosque-Plata</b> <i>USDA ARS</i>	<b>Verónica Guillemina Dominguez-Martinez</b> <i>ITM</i>
<b>Lijuan Zhou</b> <i>LBA CICA DACA UJAT</i>	<b>Victor M. Toledo-López</b> <i>Silpakorn University</i>
<b>Lili Rodríguez-Blanco</b> <i>UJAT</i>	<b>Waranyoo Pulsawat</b> <i>Dept. Micro &amp; Immuno LUMC</i>
	<b>Youngang Zhai</b>

**Figure 1. List of participants in the organization of the event.**

The people involved in every one of the above committees is listed in figure 1.

Figure 2 shows a picture of the presidium at the Summit's opening ceremony and figure 3 is a picture of some of the participants. The participation of authorities from the Mexican Government reflects the recognition acknowledged to the event by the local authorities.

There were 303 assistants and 58 poster contributions from six areas/color plus 16 oral presentations (74 contributions). The Abstracts to these oral presentations were published in the February issue (vol. 2, issue 1, 2012) of IBCJ. For the areas associated to each color please refer to the last section of this issue at pg. 19.

A statistical summary of the number of contributions by color/area is given in figure 4.

## Funding

In addition to the registration fees and the contribution by all the attendees, the event was possible thanks to the financial aid provided by several organizations and companies. Those companies and institutions providing financial support to the event are included in figure 5. The organizers are indebted to all of them.



**Figure 2. OPENING CEREMONY (Monday March 19)** - Welcome and Introduction of the Presidium. From left to right Dra. Leticia Olivera Castillo (Master of Ceremony, CINVESTAV IPN Mérida), Dr. Jaime Padilla Acero (Scientific Director of AgroBio México), Dra. Marcela Zamudio Maya (Director FIQ-UADY), Dr. Inocencio Higuera Ciápara (director of CICY representative from CONACYT), Dra. Susana Lozano Muñiz (president of the Foundation), Dr. Tomás González Estrada (Director General of CONCYTEY representative of the Governor), M.C. Jaime Piña Razo (Director of INIFAP Southeast) y M.C. Abel Zapata Dittrich (Director of Instituto Tecnológico de Merida). As special guest: Dr. Romeo de Coss Gómez (director CINVESTAV-Mérida), Dra. Ingrid M. Rodríguez Buenfil (CIATEJ Unit Southeast Director, M.C. Roger F. Vázquez Aguilar (IT Conkal Director), Dr. Jorge Zavala (Director CIR-Hideyo Noguchi)..



**Figure 3. Some Participants.** From left to right Carlos Alberto Blanco (USA), Zhong-Ren Lei (China), Ryan W. Kurtz (USA), Susana Lozano-Muñiz (Mexico), Elena Elpidina (Rusia), Patricia Tamez-Guerra (Mexico), Alejandra Bravo (Mexico), Clara Inés Saldamando-Benjumea (Colombia), Ana María Vélez (Colombia), Ingeborg Zenner de Polonia (Colombia), Nicholas Storer (USA), Robert W. Behle (USA), Jeffrey A. Fabrick (USA), Miguel Serrano (Honduras), Isaac Oyediran (USA), Juan Luis Jurat-Fuentes (España), Jaime Padilla Acero (Mexico), Mario Soberón (Mexico), Bruce E. Tabashnik (USA), Nicholas P. Storer (USA), J. Angel Saavedra (Mexico), J. Lindsey Flexner (USA), Michael Caprio (USA), Anthony M. Shelton (USA), Yulin Gao (China).

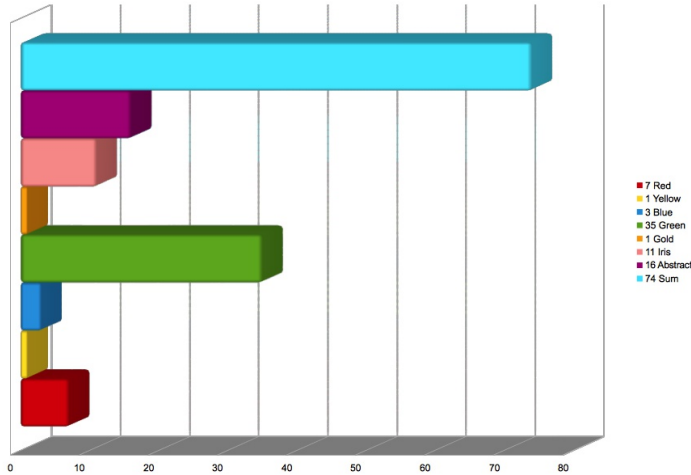


Figure 4. Number of presentations by color (area).

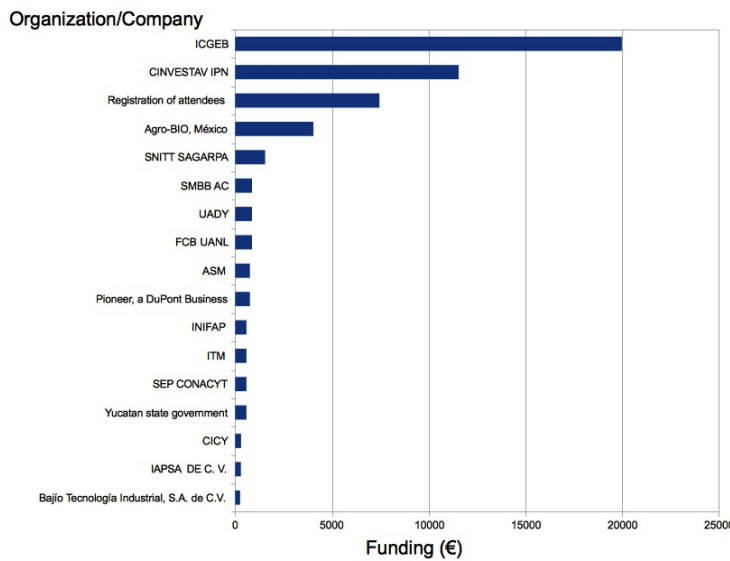


Figure 5. Organizations and Companies funding the event.

### Best Poster Presentation Awards

Presentations at poster sessions were evaluated by the organizers, and the best porter presentations were awarded:

First place

## CUCURBITA FICIFOLIA FRUIT AS INSULIN SECRETAGOGUE IN RINM5F CELLS

María Elizabeth Miranda Pérez<sup>1</sup>, María Del Carmen Escobar Villanueva<sup>1</sup>, Jesús Vladimir Hernández Rosado<sup>1</sup>, Fausto Sánchez Muñoz<sup>1</sup>, Julio César Almanza Pérez<sup>1</sup>, Francisco Javier Alarcón Aguilar<sup>1</sup>, Clara Ortega Camarillo<sup>2</sup>

<sup>1</sup>Laboratorio de Farmacología Universidad Autónoma Metropolitana unidad Iztapalapa (UAM-I) Avenida San Rafael Atlixco 186 Vicentina, 09340 Ciudad de México, Distrito Federal. <sup>2</sup>UIM Bioquímica, Hospital de Especialidades, CMN SXXI, IMSS. Corresponding author: [mirandapme@hotmail.com](mailto:mirandapme@hotmail.com)

**Abstract:** Taking into account that the diabetes mellitus (DM) is an important public health problem globally, like part of a work to development a product added with an aqueous extract of *Cucurbita ficifolia* fruit with a possible use to the treatment of DM, a aqueous extract of this fruit was obtained and chemically characterized by it's content of D-quirositol, the principal hypoglycemic compound of the fruit. To study the mechanism of hypoglycemic activity of this extract and of the D-quirositol alone, RINmF5 cells were exposed to different concentrations of both, and production insulin and Kir 6.2 channels were measured. Cells treated with D-quirositol and *C. ficifolia* increased mRNA expression of insulin and Kir 6.2 compared with control group, suggesting a mechanism of action throughout of increment in the expression of the gen of insulin. This research supports the idea of develop a new nutraceutic product from *C. ficifolia* fruits like a co-adjutant in the treatment of DM.

**Keywords:** DM /Insulin /Kir 6.2 /*C. ficifolia*

Second place:

**AXENIC ESTABLISHMENT AND IN VITRO FORMATION OF ADVENTITIOUS SHOOTS IN NARDO (POLIANTHES TUBEROSE L.)**

Addy Yolanda Tejero Peña<sup>1</sup>, Luis Leonardo Pinzón López<sup>1</sup>, Eduardo Villanueva Couoh<sup>1</sup>, Arturo Reyes Ramírez<sup>1</sup>, Delfino Reyes López<sup>2</sup>.

<sup>1</sup>Instituto Tecnológico de Conkal, Yucatán, México. <sup>2</sup>Benemérita Universidad Autónoma de Puebla, México. Corresponding author: [addy\\_210505@hotmail.com](mailto:addy_210505@hotmail.com)

**Abstract:** The nard (*Polianthes tuberosa* L.) is a plant endemic to Mexico that is used in the pharmacological and fragrances industries, as well as ornamental plant (Herrera, 1990). In ornamental exploitation, the species offers little or no genetic variability, which reduces the opening of new markets, limiting their profitability. In this context, biotechnology through genetic transformation or induced mutagenesis, offer possibilities for breeding of new varieties. However, both techniques depend for their success of micropropagation protocols that enable their generation and mass propagation of new varieties. Therefore in the present study we evaluated three disinfectant agents (H<sub>2</sub>O<sub>2</sub>, Bioaxénico® and NaClO) for establishing aseptic tissue bulbs and 11 combinations ANA/BA to form adventitious shoots, in a basal medium. It was determined that using NaOCl (3% a.i) the axenic tissue percentage was 65% and the formation of adventitious shoots via direct organogenesis was achieved with a frequency of up to 4 shoots per explants in the treatment of 7mM BA in the absence of ANA. **Keywords:** Axenic /Benzyladenine /Naphthaleneticacid /Organogenesis.

Third place:

**ISOLATION OF CELLULOSE-HYDROLYTIC BACTERIA CAPABLE OF HYDROLYZING CITRUS PEEL WASTE**

López-Domínguez Cyndi, Rodríguez-Buenfil Ingrid, Ucan-Hernandez Xemón, Evangelista-Martínez Zahaed, and Sánchez-Contreras Angeles

Unidad Sureste del Centro De Investigación y Asistencia en Tecnología y Diseño del Estado De Jalisco A.C. Corresponding author: [msanchez@ciatej.net.mx](mailto:msanchez@ciatej.net.mx)

**Abstract:** A cellulose-hydrolytic bacterium isolated from the rumen of *Bos indicus* was examined for their ability to hydrolyze citrus peel waste. Cellulose-hydrolytic ability was screened using microcrystalline cellulose as a carbon source and Congo Red Assay. The cellulose-hydrolytic bacterium was identified by 16SRNAlike *Klebsiella* sp. This strain is a cellulolytic microorganism that produces large extracellular multienzyme complexes called cellulosomes in culture broth of citrus peel. **Keywords:** *Klebsiella* sp. /Citrus peel /Hydrolysis

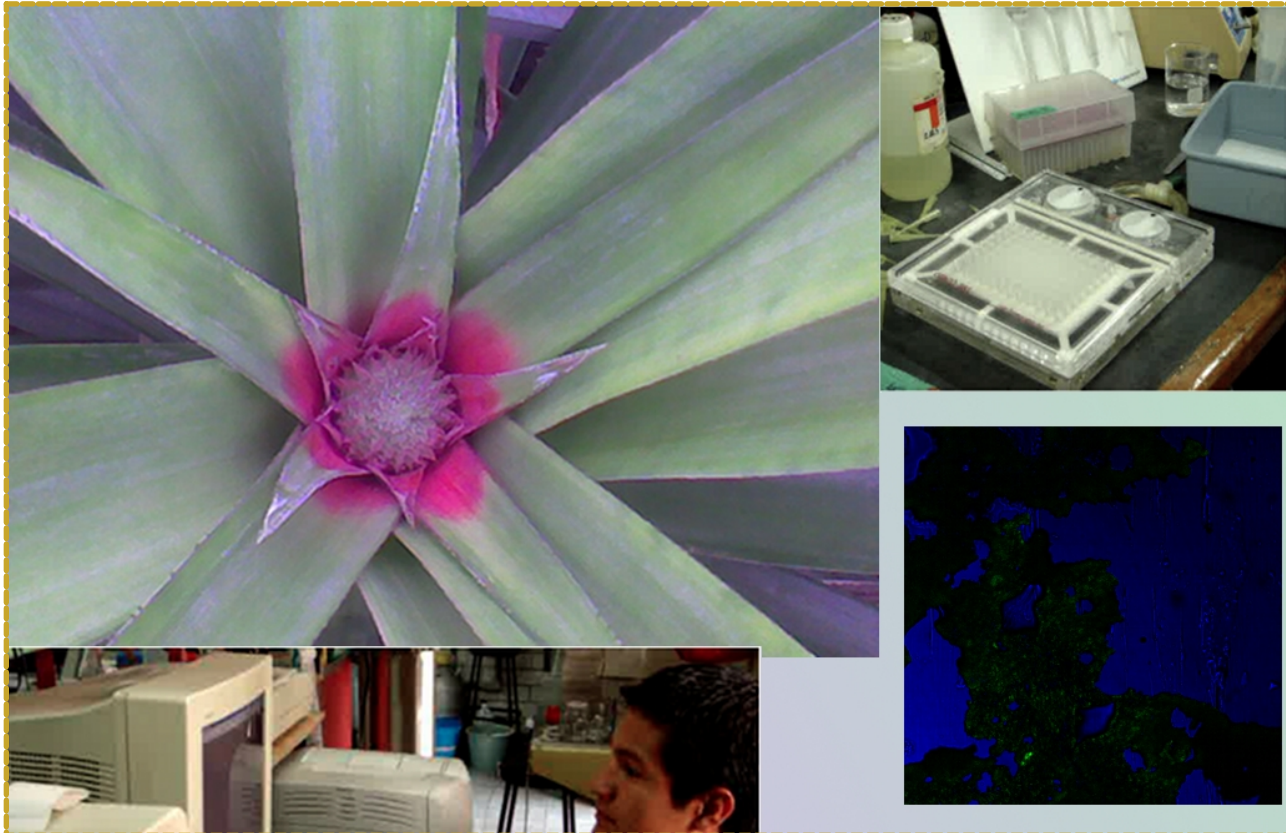
*Related References*

1. Fernández-Luqueño F, López-Valdez F, Lozano-Muñiz S. (Eds.). Biotechnology Summit 2012, Yucatán México. pp. 1-5. 12-21 March 2012.
2. Int. Biotech. Color J. 2(1) 7 - 36. Special issue: Abstracts to the sessions of the Biotechnological Summit 2012, March, 12th to 21th of 2012.



# International Biotechnology Color Journal

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The **International Biotechnology Color Journal (IB CJ)** is the official trimonthly scientific Journal of the International Foundation for Biotechnology Research & Early Stimulation in the Culture of Health, Nutrition, Sport, Art, Science, Technology & Society A.C., a nonprofit corporation.

**IB CJ** is devoted to facilitating the advancement of our understanding of Biotechnology in its broader definition: The application of science and technology to living organisms, as well as parts and models thereof, to alter living and non-living materials for the production of knowledge, goods and services.

**IB CJ** is committed to publishing original contributions of research in all areas related to the theory and practice of biotechnology in its broadest context (organized by color), including research articles and notes, critical reviews, essays, book reviews, letters, correspondence, and news features or views.

**IB CJ** intends to provide an excellent resource for the publication of peer-reviewed research papers with proven or likely implications for the past, current, and future practice of biotechnology.

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Manuscripts submitted to the **IB CJ** will be assigned to one the scientific **IB CJ** Editor, according to the section suggested by the corresponding author. The **IB CJ** Scientific editor will determine if the manuscript is within the journal scope, has high scientific quality, is presented in a manner suitable for publication in a scientific peer-reviewed journal, the content has not been published elsewhere, and if it has not been previously rejected by this journal. If the submission is considered to meet all of the above criteria, it will be forwarded to additional to referees with enough expertise in the field, for further review. Referee's names will not be disclosed, but their comments will be forwarded to the authors.

Authors should suggest the section in which their work is best placed form:

Area colors and their scope		
<b>RED</b>	Medical Biotechnology:	<i>human health &amp; disease, novel medical diagnostics and tissue engineering.</i>
<b>YELLOW</b>	Nutritional Biotechnology:	<i>Food, nutrition science and nutraceuticals.</i>
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<b>DARK GREEN</b>	Agricultural Biotechnology:	<i>Biotechnology for the cultivation, processing, and storage of plants. Plant tissue culture and micropropagation. Biofertilizers, agrobiochemicals, and plant pests and disease control. Biotechnology in plant ecology and biodiversity;</i>
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<b>PURPLE</b>	Patents, IPR:	<i>Strategy for intellectual property protection, patents, publications, inventions</i>
<b>WHITE</b>	Biotechnology of GMO's:	<i>Industrial Biotechnology of Genetically Modified Organism's. Gene-based industrial applications</i>
<b>GOLD</b>	Bioinformatics:	<i>Computer applications to the study of biological systems. Micro and nanobiotechnology, mixed biological- electronic/electromechanical systems and biomachines (MEMS and NEMS, MST and NST).</i>
<b>GREY</b>	Fermentations and Classical Biotechnology:	<i>Industrial biotechnology: classical fermentation &amp; bioprocess/bioengineering technology; engineering and technological equipment for bioproduction; output of science-intensive bioproducts</i>
<b>IRIS</b>	Multidisciplinary area:	<i>Biochemistry, molecular biology &amp; biotechnology, Omics applications</i>
<b>PLATINUM</b>	Synthetic Biology	<i>Design and obtention of new biological components, devices, and systems. Applications of re-designed natural biological systems.</i>
<b>SILVER</b>	Biobusiness, Bioentrepreneurship & Marketing:	<i>Development economics, Biobusiness and marketing. Strategy for innovative economical development. Improvement of the system of the S&amp;T and innovation activities management</i>
<b>TRANSPARENT</b>	Biotechnology, Bioethics & Society:	<i>Assesment of the public support to the scientific activity. Biotechnological potential and human resources</i>
<b>INDIGO</b>	Integrating science, education and manufacturing:	<i>Education &amp; early childhood stimulation in the culture of health, nutrition, sport, art, science, biotechnology &amp; society as information and telecommunication technologies TIC'S</i>

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- **CONTRIBUTION ARTICLES.** Manuscripts in this category must include the following sections: Title, Authors, Authors affiliations, Contact address, phone number and e-mail of the corresponding author, Running title (60 characters maximum), Abbreviations, Abstract, key words, Introduction, Materials and Methods, Results, Discussion, Conclusion, Acknowledgments and References.

The manuscript should present results of a complete, original and verifiable research. In regular manuscripts, text should be no more than 10 pages, including tables and figures and references. With a charge to the authors, longer papers may be accepted, if the scientific value of the paper does justify so.

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Book reviews must present a critical and concise view of the contents and value of a recently published book.

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Letters to the editor should deal with topics of high relevance and/or novelty, or those of a polemical nature in any of the color areas listed above. The should be supported by appropriate recent references, and offer a novel point of view to the issue they address. The text should not be more than 3 pages.

- **CORRESPONDENCE.** No sections are required, and the text should not be more than 1 page. Correspondence are brief comments to enrich or criticize a previous article published in the journal. This contributions will be accepted if the Editor considers the comment relevant and of interest to the readers of ICBJ. Personal views lacking scientific support will not be accepted.

- **NEWS AND VIEWS.** No sections are required, and the text should not be more than 2 pages. News and views are short comments of very recent findings published in the ICBJ, or in some other international journal. They should be brief, insightful, and well referenced.

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A cover letter addressed to the IBCJ Chief editor and signed by the corresponding author. In this letter the corresponding should indicate the section where the submitted contribution fits best. Names and addresses of three potential referees, or the name of research scientists they wish to exclude from the review process.

**For submission purposes, tables and medium-quality figures may be included in the pdf document.** However, the **authors should accompany their submission with separate high quality figures.** This must be done at the time of submission, since reviewer's may need high quality images to verify their clarity and consistency with the text.

The IBCJ Chief editor will acknowledge manuscript receipt, along with the manuscript submission code (MSC), and the name and e-mail address of the assigned IBCJ Scientific (COLOR) editor. Further correspondence relating the submission should be addressed to the IBCJ Scientific editor indicating the MSC.

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Authors may also address the IBCJ Chief editor in case of conflict with the IBCJ Scientific editor.

The final choice of referees will be made by the IBCJ Scientific editor. If the IBCJ Scientific editor considers essential to include a reviewer, that the author has requested to exclude, the editor will first consult the corresponding author, who may then sustain or withdraw his submission.

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**Do not send MS\_WORD XML (docx) format,** if you have prepared your MS in this format, please convert it to the old format, or to RTF. Make sure the content of your manuscript was not altered during the conversion.

Tables and illustrations should be sent separate as graphic files. Pictures, plots, graphics, equations and schemes are considered illustrations. **DO NOT EMBED EQUATIONS IN THE TEXT.**

IF REQUESTED, The author should also provide a graphic abstract, and separate figures. The graphic abstract is limited to 5 cm by 10 cm (length by width).

## MANUSCRIPT PREPARATION GUIDELINES

### Text guidelines

Pages should be numbered and lines should be numbered and double-spaced; use Times New Roman font, 12 points size. **Times Foundry has most of the regular symbols** (such as greek lettering, circles, squares, triangles, arrows, and many others), **try to use the symbols within Times foundry as much as possible**, as other fonts, such as the MS symbol, Apple symbol and Open symbol do not follow a standard convention. Symbol conversion alterations between different word-processing platforms are often due to this lack of compatibility. Page size letter (21.5 x 28 cm) with 2.5 cm margins all round. Complex tables ( those with unusual features) , illustrations graphs, and other supplementary materials are to be submitted separately to the text.

### Illustration guidelines:

The illustrations can be figures, schemes, charts, or graphics.

Illustrations should be submitted as digital documents in:

TIFF, with, 600 dpi resolution

JPG, with, 600 dpi resolution or

EPS (this is a vector-rasterized, but if your illustration has embedded non-vectorial graphics make sure all of these objects meet the 600 dpi resolution criterium).

The actual size for the final version must fit in:

One (1962 pixels, i.e. 3.27 inches width), or

Two (4098 pixels, i.e. 6.83 inches width) columns

**Avoid figures larger than 1 page (4800 pixels height), however, if essential, such figures must be split into 1 page blocks (4098x4800 pixels).**

**Panels or insets within illustrations with should be numbered using sequential letters (A, B, C, D...).**

Letters should be in bold-face,

placed in the upper-left corner of each panel,

must not be in a separate frame,

and the letter size should be chosen to avoid confusion with relevant illustration information.

The legend (see below) must clearly describe the contents of each subsection in the corresponding illustration.

Sequence alignments are considered figures, and in this case the recommended format is vectorized EPS files.

### Legend to illustration guidelines

Number your illustrations with sequential arabic numbers (1, 2, 3...). For each illustration, start the corresponding legend with a brief informative title. Then provide all essential information to make the figure clear. When not stated in the methods section, specific experimental conditions may be provided. **Do not send illustrations with figures reproduced from other publications**, as they may be copyright protected. If strictly necessary, the illustrations may be accepted, only if the author provides legal evidence of the due permission from the copyright owner, to the satisfaction of the ICBJ editorial board.

### Table guidelines

Tables should include a Table heading and, if necessary, footnotes. Illustrations should have captions, which should be provided separate to the text. Both, table headings and illustration captions should start with a brief descriptive title, and include a short description of the contents and those experimental or technical details that are essential to the unambiguous interpretation of the

data. All scientific data should be presented according to the International Units System (SI). When the introduction of a new unit of measurement is required, the unit should be clearly defined in the manuscript, base your new definitions on the SI system, as much as possible.

For the production process, you will be asked to provide your table as an illustration (see above, preferred format EPS). This illustration should not include the table heading, but may include footnotes. Include a table heading and footnotes in the "legends to illustrations" section. Sequence alignments are considered figures.

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The references can be journal citations, whole books, theses, book chapters, book chapters in a serial publication, entries in a manual/methods compilation, and internet page addresses. Patents may be cited for reference only and as long as the patent protection is not directly or indirectly violated, for this aim, the authors must provide legal evidence of the absence of conflict, to the satisfaction of the ICBJ board. All citations should refer to internationally accessible documents. The style must conform to the next guidelines:

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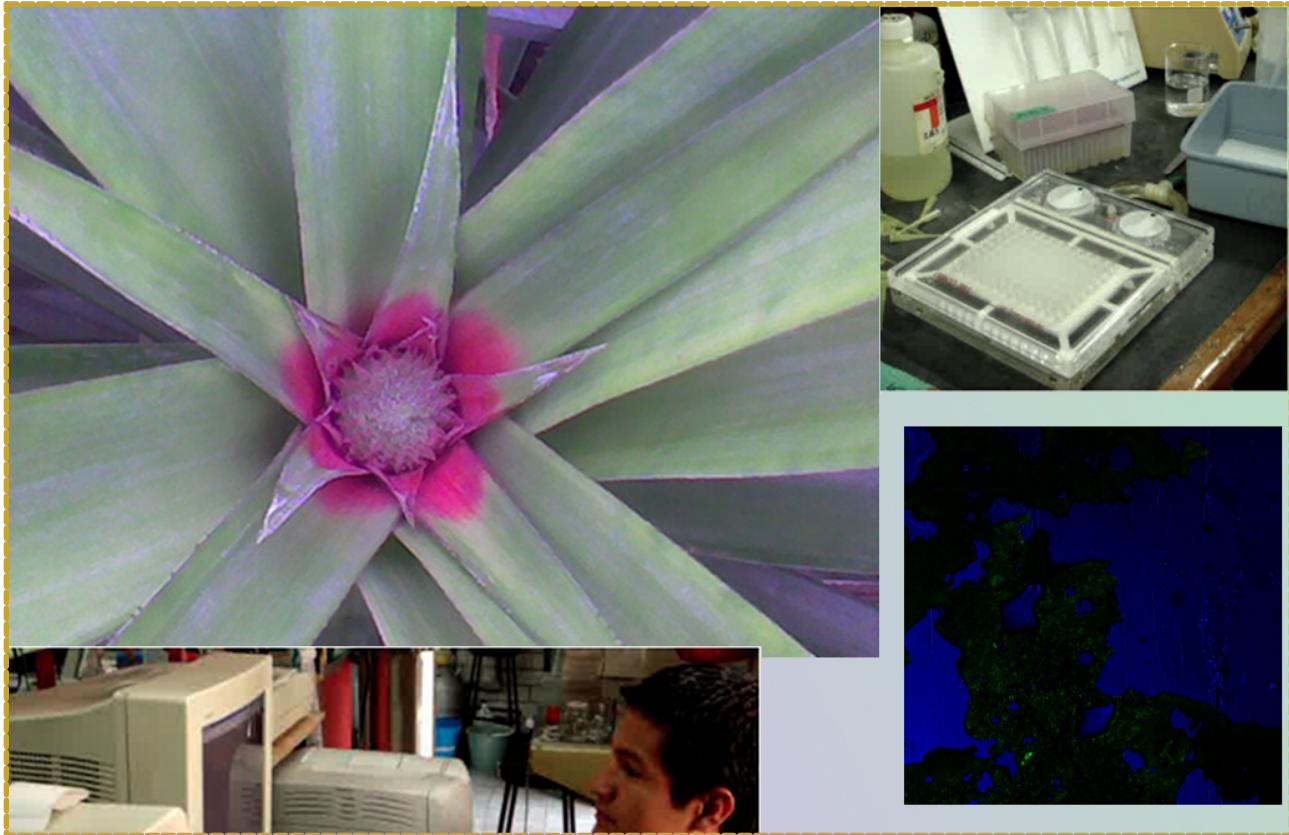
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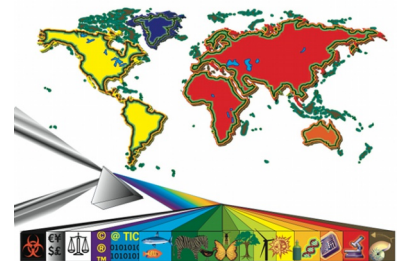
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