

Dr. N.G.P ARTS AND SCIENCE COLLEGE

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PEGASUS NEWSLETTER - 2015

DEPARTMENT OF BIOCHEMISTRY

Editorial Talk

I am extremely proud to write a message for the "Pegasus" News letter of the Biochemistry Department. It is highly gratifying to learn that this newsletter is showcasing the notable events of forth coming events, Faculty achievements, Student's achievements, Seminar / conference etc and the multifaceted achievements of the Department in the emerging field of Science. I take this opportunity to comparatively highlight the academic communities and editorial board of this newsletter for their participation in the issue of this news letter. For further sharing contact us at biozenithngp@gmail.com

About the Department of Biochemistry

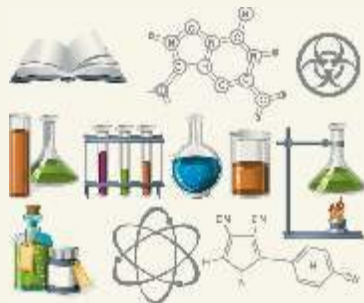
The Department of Biochemistry is a vibrant and an ambitious Department with academic staff, Doctoral researchers and PG research students. The Department is very successful in the college and is firmly committed to excellence both in research and teaching. The Department adopts an integrated approach embracing the view that tomorrow's break - through are likely to occur at the interface of traditional biological sub divisions. A degree in Biochemistry is the first step towards a variety of careers in the pharmaceutical and food industries, in the hospital service, and in many aspects of biological and medical research. The Department of Biochemistry is committed to provide outstanding teaching in the biochemical sciences in accredited programmes and to conduct quality research of high repute. It is our mission to train the students as competent professional biochemists with the knowledge, skills and values required to address the need for a high-level manpower in our nation.

Achievements of the Department

As another academic year draws to a close it's exciting and satisfying to look back at the accomplishments of our Faculty and Students.

Staff Achievements

- * The Department has granted 3 Ph.D's degrees and 4 M.Phil degrees.
- * Dr. N. Kannikaparameswari has published a paper entitled "Evaluation of antimutagenic activity of the leaves of Carica papaya" in Scrutiny International Research Journal of Health and Medical Science(SIRJ-HMS).
- * Dr. S. Gowri has presented a paper on "Antibacterial activity of copper nanoparticles synthesized from aegle marmelos" in the National conference on Biorevolution a Promising Strategy.
- * Mrs. T. Indhumathi has published a paper on "Efficacy of Ethanolic extract of Solanum incanum fruit extract for its antimicrobial activity" in International Journal of Current Microbiology and Applied Sciences.
- * Mrs. P.A.Vasundra Devi has published a paper entitled "Invitro Cytotoxicity, Free Radical Scavenging and



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Mrs. K. Rajathi

Assistant Professor

Department of Biochemistry

Dr. N.G.P ASC

Antioxidant activity of Ethanol extract of *Curcuma amada*" in the World Journal of Pharmacy and Pharmaceutical

- * Mrs. K. Rajathi has published a paper entitled "Synthesis of silver nanoparticles using *Ocimum kilimandscharium* guerke and evaluation of its antimicrobial activity" in Scrutiny International Journal of Microbiology and Bio-Technology (SIJR-MBT).
- * Dr. C. Venkatesan has published a paper entitled "Delivery of DNA vaccine using Chitosan-Tripolyphosphate (CS/TPP) nanoparticles in Asian seabass (*Lates calcarifer*) for protection against betanodavirus infection" in Aquaculture.
- * Mrs.T. Indhumathi and Mrs.K.Rajathi have participated in FDP-Workshop on "RET species for college Teachers" sponsored by MST-DBT, Government of India, New Delhi organized by the Department of Botany, PSG College of Arts and Science on 27th and 28th September 2014.
- * Mrs. P.A. Vasundra devi has presented a paper on "Invitro Cytotoxicity and Apoptotic activity of ethanol extract of *Curcuma amada* rhizome in Hela cell line" in Biotechnology -Present & Future for Sustainable Healthcare development on 29th and 30th Dec 2014
- * Mrs. T. Indhumathi and Mrs.K.Rajathi have attended Science Academies Lecture Workshop on "Biological Sciences in the 21st Century" conducted by Department of Biochemistry, P.S.G. College of Arts and Science on 23rd and 24th January 2015.
- * Dr. N. Kannikaparameswari, Mrs.T.Indhumathi and Mrs.K.Rajathi have participated in the Workshop conducted by the Department of Biotechnology, SNR Sons College, Coimbatore.
- * Mrs. P.A. Vasundra Devi has published a paper entitled "Fingerprint Profile and invitro anticancer efficacy of rhizome essential oil of *Curcuma amada* on Hela cell line" in International Journal of Biosciences and Nanosciences.

Student Achievements

- * Mr. Aravind.H of III B.Sc. Biochemistry has won the first prize in Tamil Pesu Tamilai Pesu conducted by the DD Podhigai Television on 20.02.15.
- * Ms. Donna George, M.Sc. Student has presented a paper on "Phytochemical screening..." in the National Conference on 'Biorevolution - A promising Strategy' organized by the Department of Biosciences, Sri Krishna Arts and Science College, Coimbatore on 11th February 2015.
- * Mr. Saravanan.C, M.Sc. Student and Mrs. M. Arisha Taj, M.Phil scholar have presented a paper on "Invitro Anticancer and Radical Scavenging..." in the National Conference on 'Biorevolution-A promising Strategy' organized by the Department of Biosciences, Sri Krishna Arts and Science College, Coimbatore on 11th February 2015.
- * Mr. Aravind.H of III B.Sc. Biochemistry has won the first prize in BIO QUIZ held on 22nd January 2014 in Bio Genii'14, State Level Inter Collegiate Meet organized by the Department of Biotechnology and Microbiology, Maharaja Co-Education Arts and Science College.
- * Mr. Aravind.H of III B.Sc. Biochemistry has awarded with Swami Vivekananda Young Achiever Award-2014 by Bharathiar University on 09.0.2015.
- * Mrs. L. Vijayarani, M.Phil Scholar and Mr. Dhana Rangesh Kumar, Ph.D Research Scholar have attended XXIV Prof. K.S. Sonachalam Memorial Research Methodology Workshop organized by the Department of Economics, Annamalai University during 6th-9th January 2015.
- * Mrs. L. Mohanasundari, Ph.D Research scholar has presented a paper entitled on "Anticancer activity of *Alpinia officinarum* and *Alpinia purpurata* against Dalton..." in an International Conference on "Recent Advances in Bionano-Science and Technology" on 25th and 26th Feb 2015.
- * Mr. S. Kirubakaran of B.Sc. Biochemistry has participated in a Three day Entrepreneurship Awareness Camp held from 13.10.2014 to 15.10.2014.
- * Ms.Kavitha.K and Ms.Indhumathi.S of II B.Sc. Biochemistry have won the second prize in the event Scientific collage and Rangoli, Ms. Mahalakshmi.G of II B.Sc. Biochemistry has won the second prize in nutritious food and first prize in Model Making, Ms. Kalaimathi.K and Ms.Meena.M of II B.Sc. Biochemistry have won the first prize in Poster presentation, Ms.Meena.M of II B.Sc. Biochemistry has won the first prize in painting, Mr.Aravind.H and Mr.Abuthakir.K of III B.Sc. Biochemistry have won the third prize in Quiz competition in the National Conference on "Advances in Science and technology" sponsored by MST-DBT organized by the Department of Botany, PSG college of Arts and Science on 12th and 13th Sep 2014.
- * Mr. Aravind.H and Ms. Karpagajothi of B.Sc. students have won the third prize in Tamil Debate, Mr.Aravind.H and Mr.Abuthakir.K won

first prize in Quiz competition, Mr. Abuthakir.K has won the second prize in soap carving and Mr. Aravind.H of III B.Sc. biochemistry has won the first prize in Just a Minute in NGP FEST' 2014 celebration held on 22.12.14.

- * Mr. Aravind.H of B.Sc.Biochemistry secured first prize in Tamil Speech and Ms.Gayathri.S of III B.Sc.biochemistry secured second place in Tamil composition writing conducted by Ilangovadikal Tamil Foundation of Dr. N.G.P Arts and Science College, Coimbatore on 11.09.14.
- * Mr. Aravind.H of III B.Sc.Biochemistry has participated and won the third place in the event General quiz in the Interdepartmental Competition " Commercial Blast 2K14" organized by the Department of Commerce, Dr. N.G.P Arts and Science College on 17th July 2014.
- * Mr. Aravind.H of III B.Sc. Biochemistry has won the first prize for QUIZ in Professional Hunt-2014 organized by the Department of Commerce with Professional Accounting, Dr. N.G.P arts and Science College on 30.07.2014.

HIGHLIGHTS OF THE DEPARTMENT

INSPIRE SCIENCE CAMP 2014

The Department of Biochemistry has conducted the DST-sponsored Inspire Science camp for a period of five days from 21.07.14 to 25.07.14 for the school children. Dr. E.Balagurusamy, Former Vice- Chancellor of Anna University, Chennai, inaugurated the Science camp. Eminent resource persons Dr.T.J.Pandian, Visiting Professor, CAS in Marine Biology, Annamalai University, India, Dr.A.Subbiah Pandi, Head, Department of Physics, Presidency College, Chennai, Group captain (Dr.) Rajeev Kumar Mehajan, IAF Programme officer - Director "Atmospheric Observations Systems" & "Airborne Platforms" division, Prithvi bhawan, Ministry of Earth Sciences, New Delhi were invited for the camp.



DST sponsored INSPIRE Science Camp 2014 was conducted by our Department of Biochemistry from 21st-25th July 2014



DST sponsored INSPIRE Science Camp 2014 was inaugurated by Dr. E. Balagurusamy, Former Vice- Chancellor of Anna University, Chennai on 21st July 2014.

SCIENCE ACADEMICS LECTURE WORKSHOP



The Department of Biochemistry has conducted the Science Academics Lecture Workshop on "Emerging trends in Biological Sciences" sponsored by Indian Science Academy from 7th-9th October 2014. Prof.K.Veluthambi, Professor (Rtd), UGC-BSR Faculty Fellow, School of Biotechnology, Madurai Kamaraj University, Madurai inaugurated the Technical session.



The Department of Biochemistry has organised the Endowment Guest lecture on "Interesting aspects of Nanoscience and Nanotechnology" on 18th December 2014. Dr.D. Raghupathy, Assistant Professor, Department of Chemistry, NIT, Karaikal was the Chief guest of the Endowment Lecture.

- * The Department of Biochemistry has conducted the Orientation Programme for Biosciences. Dr. Chitra Rajendran, Group Leader, University of Regensburg, Institute of biophysics and Physical Biochemistry, Germany was the chief guest for the orientation programme for biosciences and a session on "Recent Trends in Membrane Protein and X-ray Crystallography" was conducted during 03.02.15.



Dr.D.Santhanalakshmi, Scientist fellow, CSIR Marine Salt Research Institute Bhavnagar, Gujarat, India was invited on 24.12.14. to deliver a talk on "Membranes in Environmental Pollution control technology"



Dr. D. Puthira Prathap, Principal Scientist, agricultural extension, Sugarcane Breeding Institute, ICAR, Coimbatore was invited on 07.01.15 to deliver a guest lecture on "ICT based Knowledge Management in Agriculture"



An Orientation Programme for biosciences by Dr Chitra Rajendran, Group Leader, University of Regensburg, Institute of Biophysics and Physical Biochemistry, Germany on 03.02.2015

Invited Lectures

| S.NO. | DATE | TOPIC | GUEST |
|-------|----------|--|--|
| 1. | 30.06.14 | Plant molecular Pharming | Dr. R. Sathish Kumar Assistant Professor and Group Leader Plant Genetic Engineering Laboratory Bharathiar University, Coimbatore |
| 2. | 08.07.14 | Animal tissue culture | Dr. Radha Palanisamy Research Associate, Kuringi Hospital, Coimbatore |
| 3. | 18.12.14 | Interesting aspects of nanoscience and nanotechnology | Dr. D. Raghupathy , Assistant Professor Department of chemistry, NIT, Karaikal |
| 4. | 24.12.14 | Membranes in Environmental Pollution control technology | Dr. D. Santhanalakshmi , Scientist fellow CSIR Marine Salt Research Institute Bhavnagar, Gujarat, India |
| 5. | 07.01.15 | ICT based Knowledge Management in Agriculture | Dr. D. Puthira Prathap Principal Scientist, Agricultural Extension Sugarcane Breeding Institute, ICAR, Coimbatore |
| 6. | 20.01.15 | Value added Foods and Future Perspectives | Dr. Dorothy Jaganathan Professor, Food Science & Nutrition Avinashilingam University |
| 7. | 30.01.15 | Sustainable sugar production in Changing global climate scenario | Dr. S. Venkataramana , Principal Scientist Sugarcane Breeding Institute, ICAR, Coimbatore |



Dr. Dorothy Jaganathan, Professor, Food Science and Nutrition, Avinashilingam University talked about "Value added Foods and Future Perspectives" during 20.01.15



The Department of Biochemistry in association with KMCH College of Nursing conducted extension activity- Health camp (Hemoglobin analysis, Eye check up, Dental Check Up) for all I year Under Graduate and Post Graduate students on 08.10.2014



Extension Activity on "Obesity and BMI" for the Students and Staff Members of Dr.N.G.P College of Education was carried out on 22.01.15

Extension Activity

The Department of Biochemistry carried out Four Extension activities.

Activity 1: "World Environment Day" at Panchayat Union Middle School, Nehru nagar, Coimbatore on 05.06.14

Activity 2: Blood Group Identification Program for all the UG first year Students of Dr.N.G.P ASC, Coimbatore was conducted on 09.07.14

Activity 3: Health Camp namely Eye check up, Dental Check Up, Hb and BMI analysis was conducted for all the UG first year Students of Dr. N.G.P ASC, Coimbatore on 07.10.2014

Activity 4: A programme on "Obesity and BMI" for the Students and the Staff Members of Dr.N.G.P College of Education was carried out on 22.01.15

HAPPINESS HORMONES - HOW TRAINING MAKES YOU HAPPY

Many of you have probably already noticed this. It can be the feeling of pure satisfaction after a completed work or the joyful anticipation of the next one - or just the growing confidence in your own capabilities. Responsible for this are biochemical processes and the release of so-called happiness hormones. The most popular ones are endorphins, dopamine and serotonin.

Reaching top Performance with dopamine!

Twenty minutes of light jogging is enough to increase the dopamine level significantly. In high-intensity sports such as Freeletics however, your brain starts to release dopamine just after a few minutes. This release makes you more alert, more focused and it improves your concentration. And to top it all off, it makes the training more fun!

As you seek to attain this state of joy again as soon as possible, you sometimes can hardly wait for your next training session. The more you train, the more dopamine will be released. Dopamine is the main reason why you feel good while exercising. Why you are able to finish your workout even if your body and mind both want to give up? After training, the level of dopamine decreases while the level of serotonin increases. Serotonin is a hormonal antagonist to dopamine and has many functions: Among other things, it is involved in the regulation of the sleep-wake cycle and body temperature; it controls the appetite and lowers the pain sensitivity. It is primarily known as a feel-good hormone because its release leads to a feeling of inner satisfaction. Thus, an intense session of Freeletics can simply translate into happiness!

Happier in the long term!

The effect of these happy making hormones is not only restricted to the immediate time during the training. In the course of actual physical effort, the brain releases dopamine and serotonin only within certain regions. But if you exercise regularly, the hormone concentration grows continuously in many areas of the brain. A sustainable improvement of concentration and an increase of happiness and satisfaction are then pleasant side effects.

Short and intense exercise sessions such as Freeletics also help to reduce the level of the stress hormone cortisol, even in the long run. Thus, your resilience concerning stress increases - whether the stress is of physical or of mental origin. Nevertheless, you should be careful. Too much exercising can also have an opposite effect and turn up your cortisol level. Your body perceives overtraining as a form of negative stress. Therefore, you should listen to your body!

With every little sense of achievement after a workout, your self-confidence increases step-by-step - and this, in turn, pushes you towards the top performances. So you will not only get fitter and more athletic but also more optimistic, confident, satisfied, powerful - and happier!

By the way:

When a perfect synergy of dopamine, endorphins, blood pressure and breathing is reached, you might get into the "flow". This is a feeling of everlasting power - you feel nothing but joy.

The Biology of Anxiety

The human body's response to fear and anxiety (stress) is exactly the same whether a threat is real or imagined. It is a remarkable example of the effectiveness of one of our internal communication systems, and is intended to help you fight off, or run away from an adversary.

The biological and chemical mechanisms that govern our emergency responses hark back to primordial times and helped our ancestors deal with threats from predators, and other tribes. Without them they would have been easy pickings. These days the things that make us fearful and anxious are benign by comparison to life as a caveman, (there are no saber-toothed tigers lurking around the corner) but our



bodies deal with threats in the same way, and it is the stress hormone cortisol which regulates this red alert system.

Hormones are Chemical Messengers

Hormones are powerful chemical messengers that help our bodies to function. They travel through the blood stream and control or regulate the activities of groups of cells or organs. Hormones are named after the Greek word hormaein, meaning "to excite" or "set in motion."

Cortisol

Under normal circumstances cortisol is continuously secreted throughout the day by the adrenal glands. These are triangular-shaped, and they sit on top of the kidneys. Cortisol secretion follows a 24 hour, or circadian rhythm, with peak levels occurring in the morning (from about 6.00am-8.00 am) and the lowest levels are at midnight. There are many factors that influence the cortisol levels including fasting, exercise, and anxiety.

The Biology of Fear and Anxiety

During the periods of fear and anxiety your muscles need more oxygen and glucose, and these are carried in the blood. So the heart has to pump faster and blood pressure must increase if your body is to get more of the vital fuel that it needs. The entire process involves several different steps and many chemical reactions, and it starts with sensory cells alerting a part of the brain known as the hypothalamus that there is potential danger. Cells in the hypothalamus transmit a signal to another area of the brain called the pituitary gland which then releases a chemical messenger into the bloodstream. This chemical is called ACTH (adrenocorticotrophic hormone) and its destination is the adrenal glands.

When ACTH arrives it stimulates both the glands to crank up cortisol production. Molecules of the chemical bind to small receptors on the surface of adrenal cells and this initiates a complex manufacturing process that turns cholesterol into cortisol. The newly-created hormone is then pumped out into the body to start a cascade of reactions that leads to increase the heart rate and blood pressure. Cortisol's main job is to increase the sensitivity of the heart and blood vessels to the stimulating effects of two other hormones, called epinephrine (also known as adrenalin) and norepinephrine (also known as noradrenalin). Epinephrine and Norepinephrine work by stimulating receptors in heart cells which increases the rate at which the heart beats and the force with which the heart muscle contracts. And you can feel it happen when your heart starts to pound wildly during fearful and anxious moments. That's the hormones are going to work!

Simultaneously, the cortisol ensures that blood vessels are also receptive to Epinephrine and Norepinephrine. The two hormones bind to specific proteins, which bring about the narrowing of blood vessel walls. This increases blood pressure and it enables blood to be diverted to essential organs and muscles.

Worried Sick

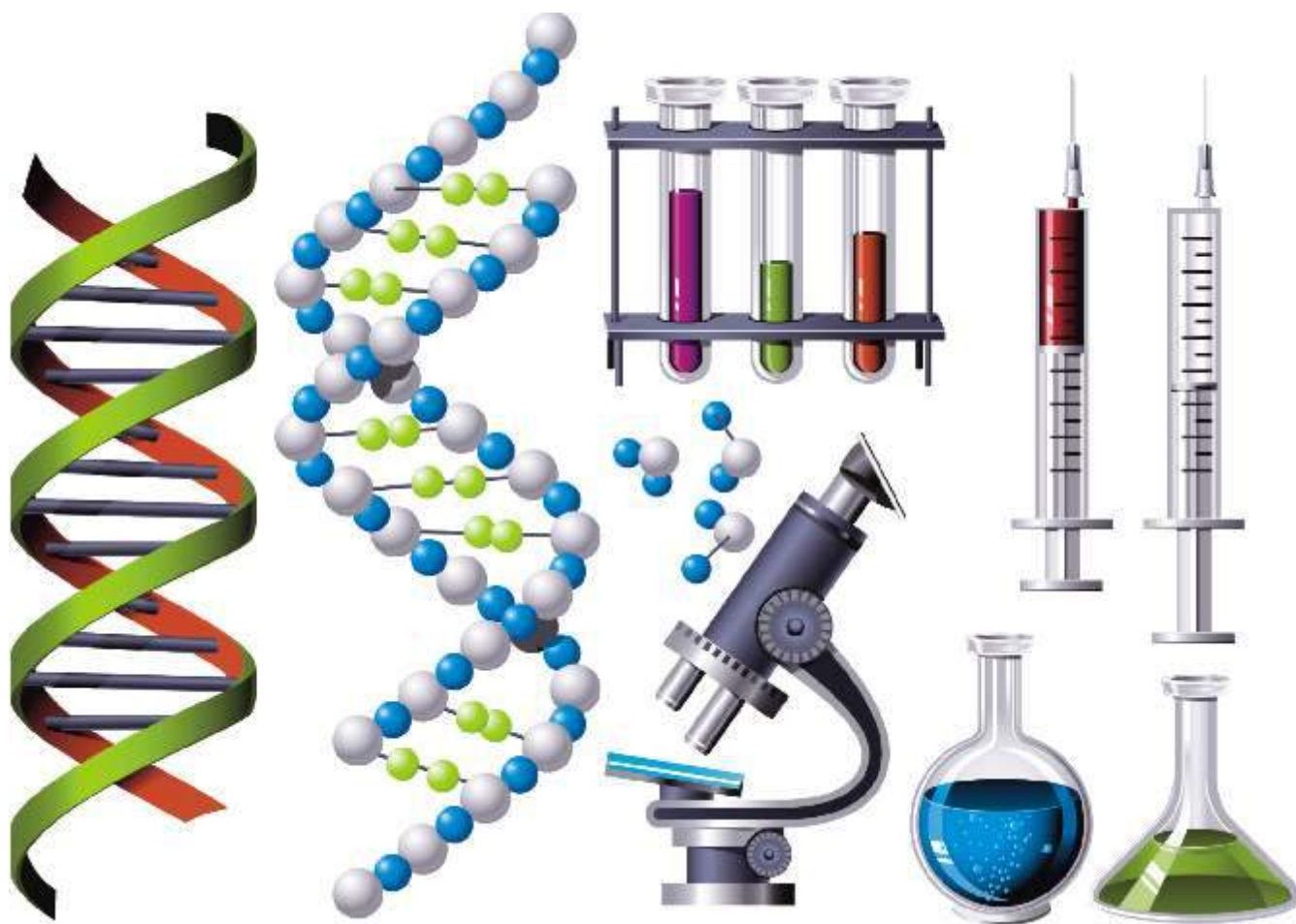
In today's modern world our stress response system is activated so often that the body is not given a chance to return to normal. High levels of cortisol are required during an emergency situation, but over time they can wreak havoc on our cardiovascular system and long term health. It is true that we can become worried sick.

Prolonged high levels of cortisol can damage the heart, contribute to obesity, and weaken the immune system. The scientific literature is full of research studies demonstrating the downsides of constant exposure to high levels of the hormone. A team of researchers from the School of Medicine at the University of California, Los Angeles discovered that the increased levels of cortisol are actually premature age immune cells, making people more susceptible to illness. The hormone suppresses the action of an enzyme called telomerase which keeps cells young.

Further negative implications include high levels of cholesterol, reduced bone density, and depression. And scientists at Heidelberg University in Germany discovered how cortisol production leads to an increased amount of fatty deposits in the liver, which creates a range of metabolic disorders.

Learn to Chill Out

Avoiding the harmful effects of cortisol can be achieved by relaxing and resetting your body. If you experience a stressful situation you need to give yourself time to calm down and recover, otherwise your life could turn out to be one continual emergency.



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