GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 3900
TO BE ANSWERED ON WEDNESDAY, AUGUST 09, 2017

DRUGS FROM SEA

3900. SHRI GODSE HEMANT TUKARAM:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the salient features of the 'Drugs from Sea' research programme;
(b) the funds allocation and utilization for the programme; and
(c) the details of the research projects currently being funded under this programme?

ANSWER
MINISTER OF STATE FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTRY OF EARTH SCIENCES
(SHRI Y. S. CHOWDARY)

(a) The salient features of the 'Drugs from Sea' research programme on "Development of Potential Drugs from Sea" are:

- **To identify bio active substances (leads) from marine biota (in coordination with multiple labs, from national research institutes and universities), synthesis of new scaffolds and their modifications for the new drug development.**
- **Identification of active principles from marine flora, fauna, and microbial biota, their chemical synthesis.**
- **Optimization of hits/leads from previous plan.**
- **Synthesis of new analogs of marine leads and their bio-evaluation.**
- **Setting up new in vitro and in vivo screens.**
- **Development of new hits/leads for various disorders.**
- ***In vitro* screening of ~300 marine extracts / fractions / single molecule.**
- **Confirmation of the *in vivo* efficacy.**
- **Pharmacokinetics, Pharmaceutical, Safety Pharmacology and Toxicity studies (preclinical studies with active samples/compounds)**
- **Clinical trial of phase I of samples/compounds identified for drug development.**
- **Clinical trial of phase II of samples/compounds identified for drug development.**
- **Collection and preservation of samples from deep sea.**
- **Extraction of bioactive compounds and initial screening.**

- **Transfer of potential candidates to the core group of Drugs from the Sea programme for further screening and testing.**
- **Undertake in-vivo screening of the active fraction/compound in suitable models and development of disease models if necessary**
- **Chemical synthesis of marine scaffolds and SAR for the new drugs development, identification, and optimization of active principles from marine flora, fauna, and microbial biota.**
- **Setting up of suitable enzymes, receptors, cell culture and animal models for biological activity for the bio-evaluation of marine extracts/ fractions/ single molecule.**

(b) The total allocation of fund for the DFS programme during XII (2012-13 to 2016-17) plan period was Rs. 9623.646 lakhs and a total amount of Rs. 2464.59502 lakhs has been actually incurred during 12th plan period.

(c) The details of the research projects currently being funded under this programme are in Annexure-I.

Annexure-I

S.No.	Project Title (Science Component)	Participating Organization
1	"Development of Potential Drugs from Ocean"	Central Drug Research Institute, Lucknow-226001, Uttar Pradesh
2	Design and synthesis of 2H-azirine containing marine natural products and their analogs for antimicrobial and antifungal activity	Indian Institute of Chemical Technology, Tarnaka, Hyderabad-500607.
3	Synthesis of marine natural products: Iriomoteolide-3a,Cladospolide-D, Barrenazine A & B and their analogues	CSIR- Indian Institute of Chemical Technology, Tarnaka, Hyderabad
4	Marine natural products aspergillide B and C and their synthetic analogues as new chemical entities for human health care	CSIR-Indian Institute of Chemical Technology, Hyderabad
5	Development of antimicrobial, antiinflammatory and anticancer agents from the marine -organisms and micro-organisms.	Central Drug Research Institute, Lucknow-226001, Uttar Pradesh Central Marine Fisheries Research Institute, Cochin
6	Isolation and characterization of bioactive compounds from marine endophytic fungi of Nellore coast in Andhra Pradesh	Sri Venkateswara University, Tirupati
7	"Bioprospecting and taxonomic studies of marine microorganisms in search of novel anti-infectives"	Institute of Microbial Technology (IMTECH), Chandigarh
8	"Identification of eight obligately halophilic cyanobacteria of the Sundarbans and molecular characterization of antimicrobial compounds there from"	Indian Institute of Chemical Biology, Jadavpur, Kolkata
9	"Comparative assessment of marine macroalgae, Ulva, Graciliaria and Saragassum from Indian region for anticancer natural products.	Centre for Biosciences, Central University of Punjab, Mansa Road, Bathinda
10	"Synthesis and Bioevaluation of Chemical Libraries of B-Carboline Based Mimics of Marine Natural Products.	CSIR-Central Drug Research Institute, BS-10/1, Sector 10, Jankipuram extension, Lucknow.

11	**"Generation of Compound Library Based on Bicyclical Acetal Scanfold in Search of Potential Anti-Cancer Agents.**	**School of Chemistry, University of Hyderabad, Central University, Gachibowli, Hyderabad.**
12	**"Design and Synthesis of Indole Based Marine Natural Product Like Lead Compounds: Quest for Anti-cancer, Anti-bacterial, Anti-fungal and Anti-inflammatory Agents.**	**Department of Chemistry, Indian Institute of Science Education and Research (IISER) Bhopal, Bhauri, Bhopal-462066**
13	**"Latrunculin and Eribulin Sub-structures Derived Macrocyclic Toolbox"**	**Department of Organic and Medicinal Chemistry, Dr. Reddy's Institute of Life Sciences, University of Hyderabad Campus, Gachibowli 500046, Hyderabad**
14	**"Ligand and structure-based screening of designed and synthesized chemical library around Psammaplin A against DNA methyltransferase 1 (DNMT1) and Diversity oriented synthesis of Pachastrissamine as anticancer agents**	**CSIR-Central Drug Research Institute, Sector– 10, Jankipuram Extension, Sitapur Road, Lucknow 226031, UP**
15	**Design and synthesis of novel kinase inhibitors based on the structures of Hymenialdisin and Variolin B**	**NIPER Hyderabad, National Institute of Pharmaceutical Education & Research, IDPL R&D Centre, Balanagar, Hyderabad – 500 037**
16	**"Isolation, Characterization and Screening of potential anti-inflammatory drugs from *Praval* (Coral) and *Shukti* (Mother of Pearl)"**	**Department of Biochemistry, Haffkine Institute for Training, Research & Testing, Acharya Dhonde Marg, Parel, Mumbai-400 012.**
17	**Cyanogramide and allied spiro-oxindole based lead identification for cancer therapy**	**Centre of Biomedical Research, SGPGIMS Campus, Raebareli Road, Lucknow -226014**
18	**Isolation of bioactive molecules from marine fauna along the east coast of Tamil Nadu and Lakshadweep.**	**Faculty of Marine Sciences CAS in Marine Biology Annamalai University**

19	**Isolation and Mass Production of β-lactamase class proteins and efflux pump inhibitors against Multidrug resistant Pathogens from Marine Actinomycetes.**	**Molecular and Nanomedicine Research Unit, Centre for Nanoscience and Nanotechnology Sathyabama University Jeppiaar Nagar, Chennai – 600119**
20	**Synthesis of Bioactive Marine Butanolides and their Analogues**	**Department of Chemistry Indian Institute of Technology Bombay Powai, Mumbai – 400076.**
21	**Chemistry and Biology of (+) Bitungolides A-E, (+)-Franklinolides A-C and Their Analogs.**	**Organic and Biomolecular Chemistry Division FCL-Building CSIR-Indian Institute of Chemical Technology, Hyderabad 500007**