GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

LOK SABHA
UNSTARRED QUESTION NO. 2909
(TO BE ANSWERED ON 12.03.2021)

RESEARCH WORK IN THE AREA OF CANCER

2909. SHRI PATEL HASMUKHBHAI SOMABHAI:

Will the Minister of SCIENCE AND TECHNOLOGY विज्ञान एवं प्रौद्योगिकी मंत्री **be pleased to state:**

(a) whether the Council of Scientific and Industrial Research (CSIR) and other Department/Institutions under the Ministry are undertaking research for treatment of cancer;
(b) if so, the details thereof;
(c) whether the CSIR constituent lab, CSIR- Indian Institute of Integrative Medicine (IIIM) is developing an anti-cancer drug code named IIIM-290 which possess potent cytotoxicity in leukemia and pancreatic cancer cells; and
(d) if so, the details thereof?

ANSWER

MINISTER OF HEALTH AND FAMILY WELFARE; MINISTER OF SCIENCE AND TECHNOLOGY; AND MINISTER OF EARTH SCIENCES
(DR. HARSH VARDHAN)

(a)&(b) Council of Scientific & Industrial Research (CSIR) through its constituent laboratories, namely, CSIR-Central Drug Research Institute (CSIR-CDRI), CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB), CSIR-Indian institute of Chemical Biology (CSIR-IICB), CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM) etc., has been pursuing R&D activities in the area of cancer. In doing so, CSIR efforts are focused on: understanding the disease biology; disease diagnostics; drug discovery and development; studying the environmental & genetic causes of specific cancers in India; and creating innovative platforms for enhancing the innovation in the domain.

The cancer research at CSIR-IGIB is focused to find ways of suppression of telomerase is important with promise in therapy. A protein called telomerase when present in high amounts is known to promote cancer,

and spread of cancer (metastasis) in different organs. Research at CSIR-IGIB shows that how telomerase, which otherwise is tightly regulated, gets mis-regulated in cancer cells. New mechanistic understanding enable researchers to design approaches that include small molecules and peptides to decrease telomerase in aggressive cancer cells. These anti-telomerase agents might have potential therapeutic value, which needs to be tested further.

The cancer research at CSIR-CDRI is primarily focused on prevention of cancer in women particularly cervical and triple negative breast cancer (TNBC). CSIR-CDRI is also exploring on design and synthesis of new clinical entities (NCE) against clinically validated targets in TNBC. Simultaneously, the institute is involved in basic research in cancer in understanding the disease biology with the objective to discover new targets in breast cancer therapy.

CSIR-IIIM has been actively working in the anticancer drug discovery area, with the aim to discover new potent and effective preclinical candidates and take them to human clinical trials. CSIR-IIIM's extensive efforts in this area, has led to the discovery of IIIM-290, a new chemical entity which display favourable profile in all preclinical studies. The regulatory safety pharmacology (IND-enabling studies) of the lead are completed, and IND filed to DCGI in January 2020. The New Drugs Division of Central Drugs Standard Control Organization (CDSCO), Government of India granted the permission to CSIR-IIIM for conducting the clinical trial of this important drug candidate IIIM-290 in pancreatic cancer patients.

Research at CSIR-IICB is focused to address different areas of Cancer mechanism, management and treatment. In the process, CSIR-IICB has been instrumental in garnering novel insights in terms of understanding the biology of the disease and also contributed significantly to paving ways for novel therapeutic approaches in Cancer treatment.

CSIR has also been supporting drug research through its infrastructure and facilities as well its creation of trained human resource to carry out drug research in the country.

Some ongoing projects at CSIR labs in the area of cancer are provided in Annexure-I.

(c)&(d) Yes, Sir. CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM) is developing an anti-cancer drug code named IIIM-290. This candidate has currently reached phase I/II clinical trial in pancreatic cancer patients.

IIIM-290 is a new chemical entity which display favourable profile in all preclinical studies. The regulatory safety pharmacology (IND-enabling studies) of the lead are completed, and IND filed to DCGI in January 2020. The New Drugs Division of Central Drugs Standard Control Organization (CDSCO), Govt. of India granted the permission, on 28th May 2020, to CSIR-IIIM for conducting the clinical trial of this important drug candidate IIIM-290 in pancreatic cancer patients. The clinical trial is expected to start soon to assess the safety, tolerability and exposure of the compound in humans along with the early efficacy indicators in pancreatic cancer patients.

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Annexure-I

Research projects in the area of Cancer Biology are being implemented at CSIR labs are as under:

S. No.	PROJECT TITLE	Funding Agency	Start date of Project	Scheduled Completion date of Project
1.	Elucidating mechanisms underlying breast cancer invasion and metastatis: Role of E3 ubiquitin ligase Fbw7 in suppressing breast tumorigenesis	Lady Tata Memorial Trust, Mumbai	06-07-2017	05-07-2020
2.	Development of small molecular inhibitor specifically targeting mTORC2 for cancer therapeutics: Development of targeted anti-cancer strategy	SERB DST	17-03-2018	16-03-2021
3.	Amino acids derived steroidal and non-steroidal Ligands as inhibitors of steroid 5-α-reductase in cancer	DAE	18-06-2018	17-06-2021
4.	Determination and structural elucidation of bioactive compounds from the selected traditional medicinal plants of Mizoram with a focus on anticancer compounds	DBT	29-09-2018	28-09-2021
5.	Targeting Triple Negative Breast Cancer (TNBC) by a plant derived small molecule: An *in-vitro* and *in-vivo* approach	SERB DST	30-07-2018	29-07-2021
6.	Role of p21Waf1Cip1 in regulation of autophagy: its implication in tumorigenesis and cancer therapy	SERB DST	25-02-2019	24-02-2022
7.	Repurposing of Anticancer Drugs for the Treatment of Malaria	DBT	12-06-2019	11-06-2022
8.	Development of Novel Small Molecule SMAC Mimetics as Cancer Therapeutics	BIRAC	03-05-2019	02-11-2020
9.	Bio prospecting of medicinal plants of Sikkim Himalaya against breast cancer angiogenesis	DBT	30-09-2019	29-09-2022
10.	Harnessing therapeutic potential of novel spisulosine derivative as robust autophagy inducer against triple negative breast cancer {TNBC) *in vitro* and *in vivo*	ICMR	22-08-2019	21-08-2022
11.	Development of new Smac Mimetic against chemotherapy resistant colon cancer	CSIR	21-07-2020	31-03-2022
12.	Deciphering epigenetic dysregulation in Hematopoietic stem cell transformation in	DBT	29.06.2017	19.12.2020

	human Myelogenous leukemia			
13.	Development of a combinatorial nano-vehicles assisted therapeutic system for the efficient treatment of Glioma	DST	23.08.2018	22.08.2021
14.	Glucocorticoid Receptor-Assisted Drug Sensitization (GRADS) in colorectal cancer therapy: Nano-therapeutic strategy towards repurposing of anti-cancer drugs	SERB	18.09.2018	17.09.2021
15.	1s Rad50 a possible molecular link between chronic respiratory diseases and lung cancer?	DBT	29.07.2015	28.05.2019
16.	Transcriptomic Analysis of µTumor Spheroid Derived from Single Cancer Stem Cell to Identify Novel Therapeutic Targets in Breast Cancer	SERB	29.01.2020	28.01.2023
17.	Bio-assay guided isolation of anti-cancer compounds from Pterocarpus santalinus and assessment of cytotoxicity, pharmacokinetics and detailed molecular mechanism	National Biodiversity Authority, Govt. of India	24.03.2020	23.02.2022
18.	Mechanism of Ets-1 transcription factor-mediated metabolic reprogramming and tumorigenesis in ovarian cancer	SERB	29.03.2017	28.03.2020

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