

REPORT

Report on participation of the ICMR International Fellow (ICMR-IF) in Training/Research abroad.

1. Name and designation of ICMR- IF : Dr. Alex George, Scientist C
2. Address :Jubilee Centre for Medical research, JMMC&RI, Thrissur-05, Kerala INDIA
3. Frontline area of research in which training/research was carried out : Protein biology and Cancer
4. Name & address of Professor and host institute: Dr. Cornelia Wilson
Senior Lecturer & Academic
Laboratory Director
Industry Liaison Lab | School of Human & Life Sciences, Discovery Park | Sandwich | CT13 9FF | Kent
Office: 01304 806 905 |
Lab: 01304 806 906
5. Duration of fellowship with exact date :15/09/2019-12/09/2020
5. Highlights of work conducted : The role of sortilin in lung progression where the results from this study will feed into a global analysis of sortilin function and target based lung cancer therapy
 - i) Technique/expertise acquired :
 - a) Preparation of Isogenic cell lines using gene-specific transfection, pTarget vector transfection into SK-MES-1 cell line to express the sortilin shRNA transfection into CALU-1 cell line to down-regulate sortilin
 - b) Extracellular Vesicle Isolation and Characterization
Using Polyethylene glycol and ultracentrifugation method characterization using Size Exclusion Chromatography (SEC), Particle analysis(Nanosight 300) and TEM
 - c) Cell viability analysis using resazurin assay.
The metabolic activity of the isogenic cell lines different treatments were noted using Resazurin assay
 - d) Wound healing assay
Wound healing assay or scratch assay will be used to determine the rate of migration of cells in the conditioned media with or without treatment
 - e) Western blot
The expression of marker proteins in -/- sort, +/- sort and +/+ sort cell lines were studied using western blot
 - f) Primer designing and qPCR. Primers designed for 11 genes identified using literature review which may be taking part in the mechanism controlled by sortilin. qPCR validated for all the 11 genes (Result is not shown as this has not yet been concluded)

- ii) Research results, including any papers, prepared/submitted for publication

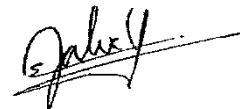
Results

- a) The sortilin deregulation (upregulation or downregulation) affects the (**Calu1 and SKMES-1**) cells, which indicates that balancing sortilin is a suggestible mechanism to control the cancer progression
- b) Sortilin is involved in the cell migration and invasion of lung cancer cell lines(**Calu1 and SKMES-1**)
- c) Sortilin is significantly increased in the low stage **cancer patients** where it tends to decrease during the progression
- d) The study shows a relation between EGFR and Sortilin expression, where EGFR decrease while Sortilin increase in the **cancer patients**

Publications 2020

- Peter J. Wilkin, Minnatallah Al-Yozbaki, **Alex George**, Girish Kumar Gupta and Cornelia M. Wilson. The undiscovered potential of essential oils for treating SARS-CoV-2 (COVID- 19) Current Pharmaceutical Design 2020 Oct 26: 1. **IF-2.208**
- Al-Yozbaki M, Acha-Sagredo A, **George A**, Liloglou T, Wilson CM. Balancing neurotrophin pathway and **sortilin function**: Its role in human disease. Biochimica et Biophysica Acta (BBA)-Reviews on Cancer. 2020 Sep 18:188429. **IF-7.365**
- Woodman C, Vundu G, **George A**, Wilson CM. Applications and strategies in nanodiagnosis and nanotherapy in **lung cancer**. In Seminars in Cancer Biology 2020 Feb 20. Academic Press. **IF-11.090**
- A fourth paper on original research in a comparative global and exosomal analysis of novel biomarkers in plasmas from lung cancer patients is prepared for the Journal of Extracellular Vesicles.

- iii) Proposed utilization of the experience in India: The research work will be continued in collaboration with the Canterbury Christ Church university (CCCU) and Jubilee Centre for Medical Research, where the results of our research will benefit local and national lung cancer research.



Signature of ICMR-IF