

Regulation of DNA replication and directed genomic movement by androgen receptor

Yong-Jie Lu

Queen Mary University of London, UK

Androgen, through its receptor (AR), plays major role in male character development and also involved in many other physiological conditions and human diseases. Previous studies of AR mainly focus on its activity as a transcription factor. During our mechanism study of androgen induced *TMPRSS2* and *ERG* gene proximity, we found that this induced gene proximity is mediated by the function of AR in controlling DNA replication rather than gene transcription process. We demonstrated that in both AR transactivation positive and negative prostate cells, androgen-induced gene proximity, is mainly associated with AR-dependent DNA replication, which relies on both the pre-replication machinery and DNA polymerase activity. We revealed that AR in cooperation with the pre-replication complex, advance DNA replication timing of certain genomic regions which lead to gene proximity, potentially through sharing the same replication factory at a similar DNA replication time. The role of AR in regulating DNA replication timing may potentially affect chromosome remodelling, cell proliferation and differentiation. This discovery should lead to fresh research in how androgen and AR contribute to body develop and physiological functions as well as to disease generation. This study may also open a new research area: Cellular function of hormones in association with DNA replication and chromosome rearrangements, which are held on many contemporary diseases.

Biography

Yong-Jie Lu has completed his medical training at Henan Medical University, and then further M.D. and Ph.D. degrees at Harbin Medical University and Peking Union Medical College, China respectively. He has performed postdoctoral studies at Institute of Cancer Research, UK and established his research team at Barts Cancer Institute, Queen Mary University of London, where he is currently hold a permanent position as Reader in Medical Oncology. He has published more than 70 papers in reputed journals, such as PNAS, Lancet and Nat Genet, and serving as an editorial board member of three international journals.

yj.lu@qmul.ac.uk