

## **Genome Maintenance and Cancer**

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Date: *once every two years (spring)*

Location: *LUMC or Erasmus MC*

Duration: *2 days*

**Preservation of genetic information (DNA) is of prime importance to all living systems. The aim of the course is to familiarize participants with the mechanisms that are involved in maintaining genome stability. In the environment humans are exposed to chemical agents and radiation, which threaten the integrity of the genetic material leading to risks for the induction of cancer and congenital malformation. To withstand the harmful effects of DNA damage and to maintain genome integrity, cells are equipped with an intricate network of DNA damage response pathways. Key players in these processes are protein complexes involved in DNA replication, DNA repair and chromosome segregation as well as regulators of the cell cycle and cell death.**

**This course will provide an up to date insight in the chain of reactions from exposure to the ultimate consequences. Lectures will deal with the basic principles of several cell biological aspects such as DNA damage formation, signalling pathways, DNA repair and mutation formation. A few lectures will deal with more applied research.**

### **Content (preliminary):**

- DNA replication associated mutagenesis
- Loss of heterozygosity and the importance for carcinogenesis
- DNA repair mechanisms and cancer susceptibility
- Human DNA repair syndromes
- UV-light and radiation induced cancer risk in human
- Oncogenes and senescence
- Cell cycle checkpoints, apoptosis
- Carcinogenesis studies with mice
- Functional screens to identify cancer relevant genes
- Application for drug discovery

***There is a minimum of 14 and a maximum of 40 places.***

*The course is free for all members of the MGC institutes. Participants from outside these institutes pay € 250 for this course.*