Geant4-DNA
User Requirements

Sébastien Incerti on behalf of both Geant4 Electromagnetic WG

CNRS, France
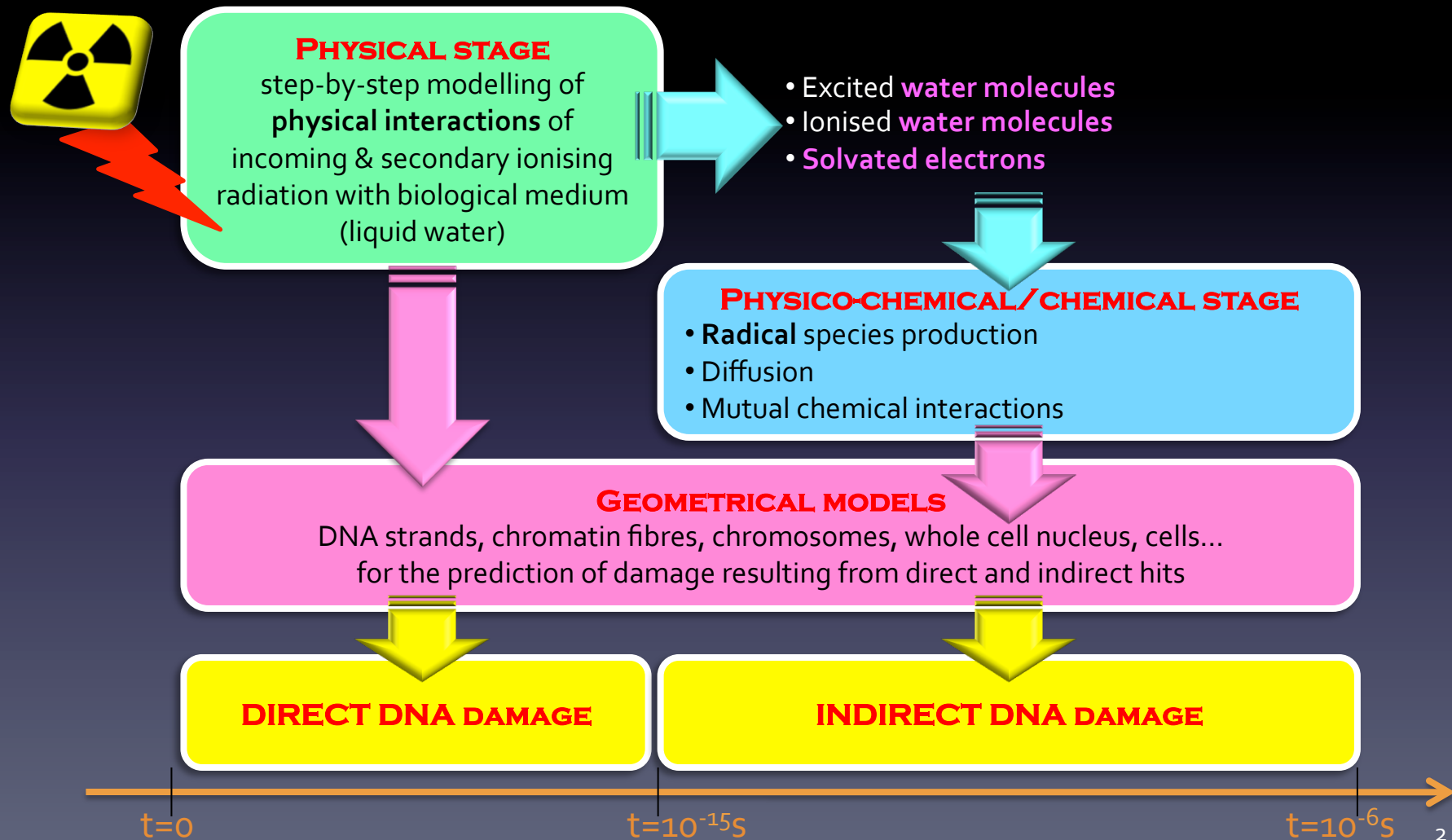
11th Geant4 Space Users Workshop

Hiroshima, Japan

August 26-28

How can Geant4-DNA model early DNA damage ?

PHYSICAL STAGE
step-by-step modelling of **physical interactions** of incoming & secondary ionising radiation with biological medium (liquid water)

- Excited **water molecules**
- Ionised **water molecules**
- **Solvated electrons**

PHYSICO-CHEMICAL/CHEMICAL STAGE
- **Radical** species production
- Diffusion
- Mutual chemical interactions

GEOMETRICAL MODELS
DNA strands, chromatin fibres, chromosomes, whole cell nucleus, cells...
for the prediction of damage resulting from direct and indirect hits

DIRECT DNA DAMAGE

INDIRECT DNA DAMAGE

$t=0$ $t=10^{-15}s$ $t=10^{-6}s$

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Please contact
incerti@cenbg.in2p3.fr
for further questions

Thanks for your attention

and specials thanks to

- The Organizing Committee

- P. Nieminen and G. Santin @ ESA

- The Geant4-DNA Collaboration

- France-Japan TYL/FJPPL Associated International Laboratory