

**Laboratoire de Biochimie Théorique**  
**Institut de Biologie Physico-Chimique**  
13, rue Pierre et Marie Curie  
75005 PARIS

## ***SEMINAIRE***

**Takayasu Kawasaki**

IR FEL Research Center, Tokyo University of Science, Japan

### **« Application of Infrared Free Electron Laser to Biomedical Technology »**

A free electron laser (FEL) is an accelerator-based intense pulse laser where the light amplification is achieved through a strong interaction of high-speed electron beam with synchrotron radiation generated in periodic-magnetic field called undulator [1, 2]. One of the greatest merits of FELs is their ability to be operated in very wide frequencies ranging from X-ray to far-infrared wavelength region.

In recent years, several facilities of IR FEL are active and open for users all over the world [3], and various original experimental studies have been conducted.

In this presentation, I will show application studies using mid- and far-infrared FELs towards development of therapeutic technology using IR FEL for melanosis and amyloidosis [4, 5].

1. P.G. O'Shea and H.P. Freund, Free-Electron Lasers: Status and Applications, *Science* 292 (2001), no.5523, 1853-1858.
2. F. Glotin, R. Chaput, D. Jaroszynski, R. Prazeres, and J. Ortega, Infrared subpicosecond laser pulses with a free-electron laser, *Phys Rev Lett.* 71 (1993), no.16, 2587-2590.
3. K. Cohn, J. Blau, W.B. Colson, J. Ng, and M. Price, Free electron Lasers in 2015, *Proceedings of FEL 2015* (2015), 625-629.
4. T. Kawasaki, A. Sato, Y. Tominaga, Y. Suzuki, T. Oyama, M. Tadokoro, K. Tsukiyama, K. Nokihara, H. Zen. Photo-Modification of Melanin by a Mid-Infrared Free-Electron Laser. *Photochemistry and Photobiology* 95, 946-950 (2019).
5. T. Kawasaki, K. Tsukiyama and A. Irizawa. Dissolution of a fibrous peptide by terahertz free electron laser. *Sci. Rep.* (2019) 9:10636.

**Jeudi 5 septembre 2019**

**14h30**

**Salle de Conférences**