



# Licensing Opportunity

UNIVERSITY OF GENEVA



## Molecular infra red to visible light Upconversion for photovoltaic and bio-imaging applications

### Invention

This technology allows the remarkable molecular upconversion of infra red to visible light opening new opportunities in many fields, like dye sensitized solar cells (DSSCs), organic PV cells or bio-imaging. This technology unlocks key technological bottlenecks in those fields.

### Applications

This technology solves at least two major problems. First, organic and dye sensitized solar cells (DSSCs), can't benefit from the IR spectrum of the sun. This spectrum represents a significant part of the electromagnetic spectrum of the sun available on earth. This technology allows to extract energy from this IR spectrum, thus increasing the conversion yield. Second, bio-luminescent probes for bio-imaging are often excited in the visible range, which generates auto-luminescence (noise) in biological materials making high resolution imaging difficult. With this technology, excitation takes place in the near IR, where no auto-luminescence takes place.

### Advantages

The main advantages of this technology are:

- It operates at the molecular level with significant dispersion and mobility advantages over nano-particles.
- It allows DSSC to capture the IR energy from the sun.
- It allows bio-imaging without the noise produced by auto-fluorescence without the need to use expensive IR cameras.
- Well separated excitation (750nm near IR) and emission (540 green) spectra.

### Status

Molecules performing efficient upconversion have been produced and fully characterized.

A European patent has been filed in 2011.

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