Electronic Supplementary Information for:

Tuning chirality in the self-assembly of rod-like viruses by chemical surface modifications

Zhenkun Zhang [a,b] and Eric Grelet [*,b]

[a] *Key Laboratory of Functional Polymer Materials, Ministry of Education, Institute of Polymer Chemistry, Nankai University, Tianjin 300071, P. R. China.*

[b] *Université de Bordeaux et CNRS, Centre de Recherche Paul-Pascal, 115 Avenue Schweitzer, F-33600 Pessac, France.*

grelet@crpp-bordeaux.cnrs.fr

Mass spectrometry of the *fd* virus modified with methyl acetimidate (fd-MA)

The details for the sample preparation and MALDI-TOF mass spectrometry were the same as reported in the previous publications.[1] The band in the SDS-PAGE containing the modified coat protein, g8p, was subjected to CNBr cleavage which selectively breaks proteins at the carboxyl side of the methionine residue (position 21) of g8p (Fig. S1). It resulted two fragments: one is the *N*-terminal part (Fragment 1) and another *C*-terminal part (Fragment 2).

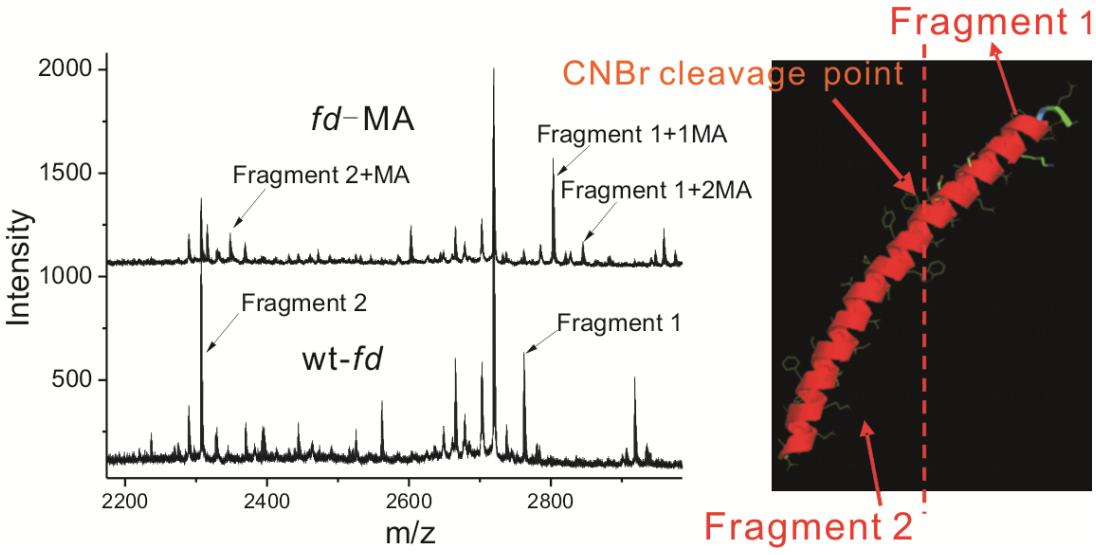

Figure S1. MALDI-TOF mass spectrometry of the coat protein of *fd*-MA after CNBr denaturation dividing the main coat protein into two fragments.

After being modified with MA, the peak in the spectrum of the wild-type *fd*, corresponding to the *N*-terminal part (Fragment 1), disappears while two new peaks appear which represent one modification (Fragment 1 plus 1 MA) and two modifications (Fragment 1 plus 2 MA) respectively. In addition, there is a peak corresponding to one modification in the *C*-terminal part (Fragment 2).

UV-visible spectra of *fd* viruses labeled with dyes (*fd*-FITC and *fd*-ROX)

For the UV-visible spectra, diluted solutions of the wild-type *fd* viruses, dye-labeled viruses and free dyes were prepared in TRIS-HCl NaCl buffer (I = 15 mM, pH 8.2). The UV-visible spectra were recorded on a Unicam UV-Vis spectrophotometer, with a scanning step of 2 nm, and are shown in Fig. S2.

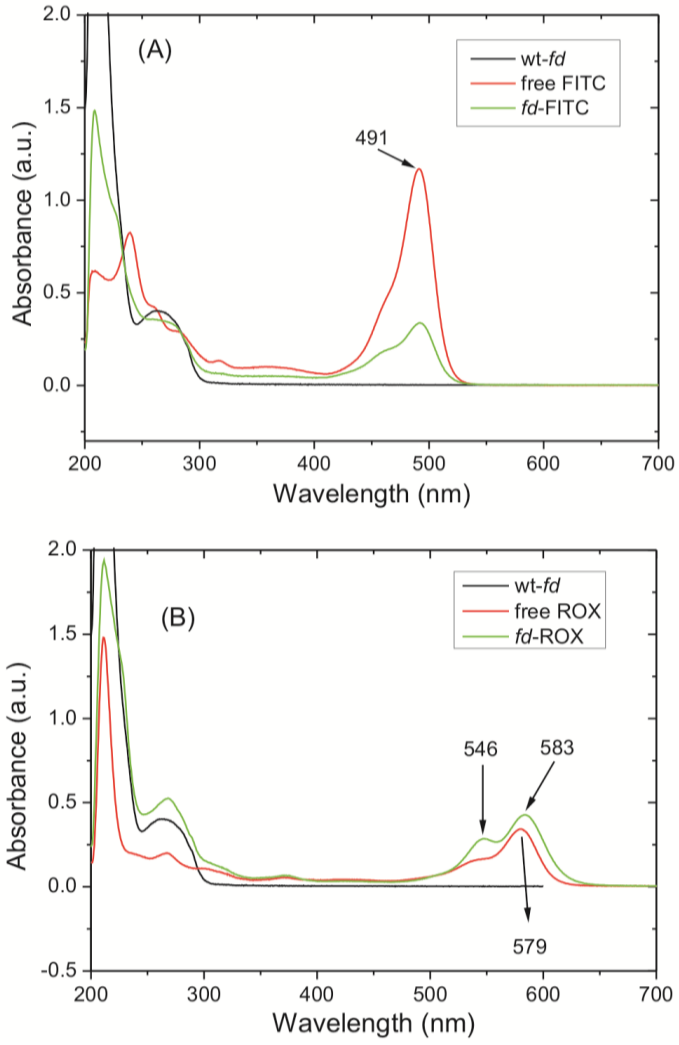

Figure S2. UV visible spectra of *fd* viruses labeled with dyes. (A) Comparison of the optical absorbance of FITC, wild-type *fd* virus and FITC labeled *fd* virus (*fd*-FITC). (B) Comparison of the absorbance of ROX, wild-type *fd* virus and ROX labeled *fd* virus (*fd*-ROX). The numbers represent the wavelength of the maximum of absorption.

Determination of A_{269}/A_{491} for pure FITC

A stock of FITC solution was prepared by dissolving FTIC in DMSO and then adding to TRIS-HCl-NaCl buffer (I=15 mM, pH 8.2). A set of samples obtained by dilution by mass with a concentration, C, ranging from 1 to 20 μg mL^{-1} were prepared in order to obtain the real concentration of the suspension of dye labeled viruses by determining the ratio, $a=A_{269}/A_{491}$. The absorption spectrum in the range from 200 to 700 nm was recorded with the use of spectrophotometer. The results are summarized in Fig. S3, and they show that the ratio *a* is independent of the dye concentration as expected.

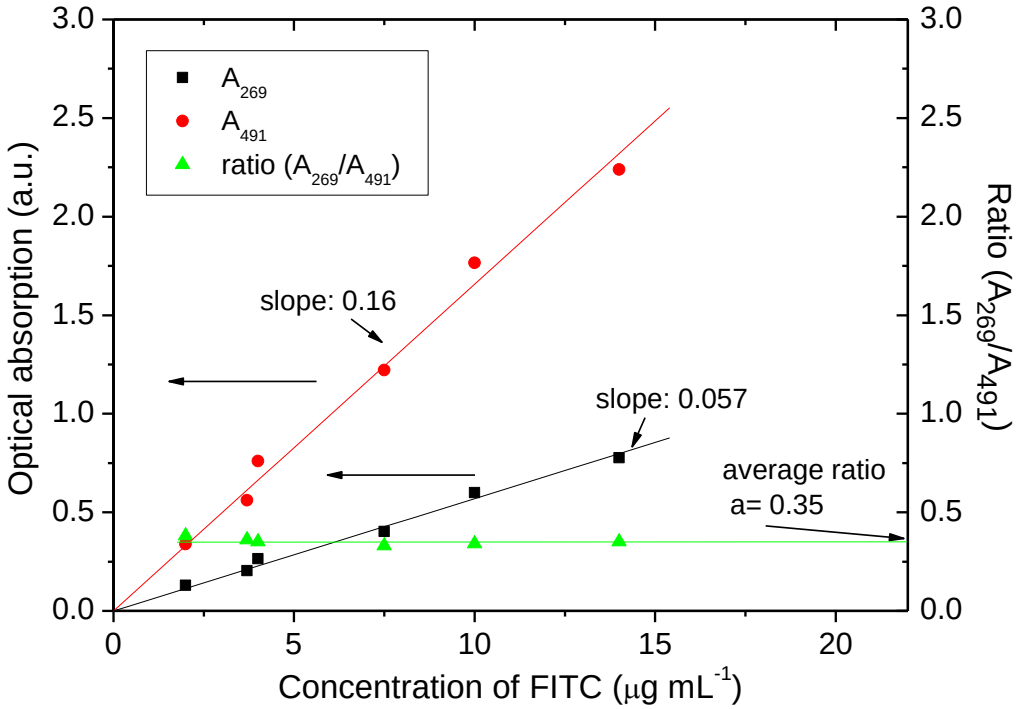

Figure S3. Absorptions of pure FTIC dye at varied concentrations.

Reference

1. Z. K. Zhang, J. Buitenhuis, A. Cukkemane, M. Brocker, B. Bott and J. K. G. Dhont, *Langmuir*, 2010, **26**, 10593-10599.