

## Preparation and self-assembly of amphiphilic polylysine dendrons - DTU Orbit (09/11/2017)

### Preparation and self-assembly of amphiphilic polylysine dendrons

Polylysine dendrons with lipid tails prepared by divergent solid-phase synthesis showed self-assembling properties in aqueous solutions. Herein, we present the synthesis of new amphiphilic polylysine dendrons with variable alkyl chain lengths (C1–C18) at the C-terminal. The dendrons were synthesized in moderate to quantitative yields by divergent solid-phase synthesis (SPS) employing an aldehyde linker. The self-assembling properties of the dendrons in aqueous solutions were studied by small angle neutron scattering (SANS) and dynamic light scattering (DLS). The self-assembling properties were influenced by the length of the alkyl chain and the generation number (Gn). Increasing the temperature and concentration did not have significant impact on the hydrodynamic diameter, but the self-assembling properties were influenced by the pH value. This demonstrated the need for positively charged amines in the head groups for the successful formation of controlled self-assemblies. Dendrons having alkyl chains below C8 did not self-assemble. Well-defined micellar structures observed with SANS were formed with alkyl chain lengths above C12. Large structures detected with DLS for dendrons with alkyl chain lengths above C12 are ascribed to intermicellar aggregates stabilized by hydrophobic and electrostatic forces in accordance with the observed pH effect. Finally, the cytotoxicity of the dendrons was evaluated in mouse fibroblast (NIH/3T3) and human embryonic kidney (HEK 293T) cells at 5, 10 and 20  $\mu\text{M}$  concentrations. The dendrons showed low cytotoxicity, displaying cell viability well above 80%.

### General information

State: Published

Organisations: National Veterinary Institute, Section for Immunology and Vaccinology, Institute for Energy Technology, University of Oslo

Authors: Mirsharghi, S. (Intern), Knudsen, K. D. (Ekstern), Bagherifam, S. (Ekstern), Nyström, B. (Ekstern), Boas, U. (Intern)

Number of pages: 15

Pages: 3597-3611

Publication date: 2016

Main Research Area: Technical/natural sciences

### Publication information

Journal: New Journal of Chemistry

Volume: 40

Issue number: 4

ISSN (Print): 1144-0546

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 3.08 SJR 0.869 SNIP 0.766

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 0.954 SNIP 0.836 CiteScore 3.27

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 1.01 SNIP 0.872 CiteScore 3.14

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 1.047 SNIP 0.838 CiteScore 3.03

ISI indexed (2013): ISI indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): SJR 1.209 SNIP 0.825 CiteScore 2.8

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): SJR 1.148 SNIP 0.81 CiteScore 2.66

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 1

Scopus rating (2010): SJR 1.282 SNIP 0.852

Web of Science (2010): Indexed yes

BFI (2009): BFI-level 1

Scopus rating (2009): SJR 1.366 SNIP 0.899

BFI (2008): BFI-level 1

Scopus rating (2008): SJR 1.549 SNIP 0.936

Scopus rating (2007): SJR 1.394 SNIP 1.084

Scopus rating (2006): SJR 1.25 SNIP 1.024

Scopus rating (2005): SJR 1.221 SNIP 0.977

Scopus rating (2004): SJR 1.17 SNIP 0.952

Scopus rating (2003): SJR 0.956 SNIP 0.869

Scopus rating (2002): SJR 1.039 SNIP 0.895

Scopus rating (2001): SJR 1.227 SNIP 0.948

Scopus rating (2000): SJR 1.153 SNIP 0.816

Scopus rating (1999): SJR 0.91 SNIP 0.848

Original language: English

Electronic versions:

02690c.pdf. Embargo ended: 30/04/2017

DOIs:

10.1039/c5nj02690c

Source: FindIt

Source-ID: 277433309

Publication: Research - peer-review › Journal article – Annual report year: 2016