

Self-Assembly and hydrogelation of peptide amphiphiles = Self-Assembly dan hidrogelasi peptida ampifil

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Abstrak

Tujuh peptida ampifil berhasil disintesis dengan metode sintesis peptida fasa padat. Karakterisasi peptida ampifil dilakukan dengan matrix assisted laser desorption/ionization Time-of-Flight Mass Spectrometer (MALDI-TOF MS). Studi dengan atomic force microscopy (AFM) menunjukkan bahwa peptida ampifil dengan linker glisin, valin dan prolin melakukan self-assembly dalam pelarut air membentuk struktur nanofiber berukuran 100-200 nm. Berdasarkan penelitian, peptida ampifil yang bermuatan positif atau negatif memiliki kemampuan self-assembly yang sama. Uji pembentukan hidrogel memperlihatkan peptida ampifil memiliki kemampuan sebagai material low molecular weight gelator (LMWG). Peptida ampifil yang memiliki alkil C-12 dan C-16 memiliki kemampuan hidrogelasi yang lebih baik dibandingkan C-8. Lima dari tujuh peptida ampifil memiliki nilai minimum gelation concentration (MGC) kurang dari 1% (w/v).

.....Seven peptide amphiphiles were successfully synthesized using solid phase peptide synthesis method. Peptide amphiphiles were characterized using Matrix-assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometer (MALDI-TOF MS). Atomic force microscopy (AFM) study showed that peptide amphiphiles having glycine, valine, or proline as linker, self-assembled into 100-200 nm nanofibers structure. According to our research, both peptide amphiphile with positive and negative charges bear similar self-assembly properties. Peptide amphiphile also showed its capability as low molecular weight gelator (LMWG). Peptide amphiphiles bearing C-16 and C-12 as alkyl showed better hydrogelation properties than C-8 alkyl. Five out of seven peptide amphiphiles have minimum gelation concentration (MGC) lower than 1% (w/v).