Supplementary Materials

Synthesis of Novel Tamarind Gum-co-Poly(Acrylamidoglycolic Acid) based pH Responsive semi-IPN Hydrogels and their Ag Nanocomposites for Controlled Release of Chemotherapeutics and Inactivation of Multi Drug Resistance Bacteria

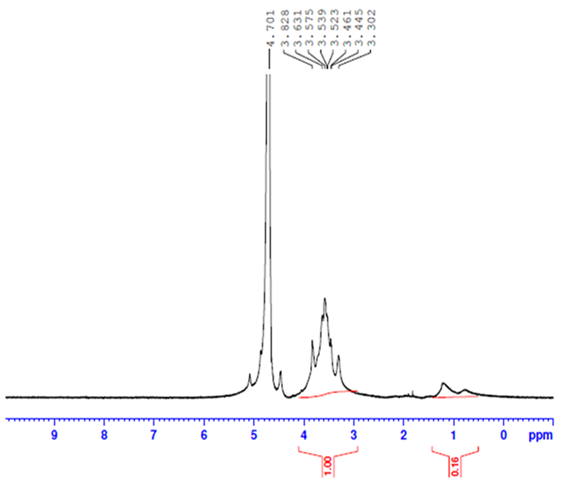
Kasula Nagaraja1, Kummari S.V. Krishna Rao1, \*, Sunmi Zo2,3, Sung Soo Han2,3, Kummara Madhususdana Rao2,3,\*

1 Polymer Biomaterial Design and Synthesis Laboratory, Department of Chemistry, Yogi Vemana University, Kadapa 516005, Andhra Pradesh, India; nagarajakasula33@gmail.com (K.N.)

2 School of Chemical Engineering, Yeungnam University, 280 Daehak-Ro, Gyeongsan, Gyeongbuk, 38541, South of Korea;

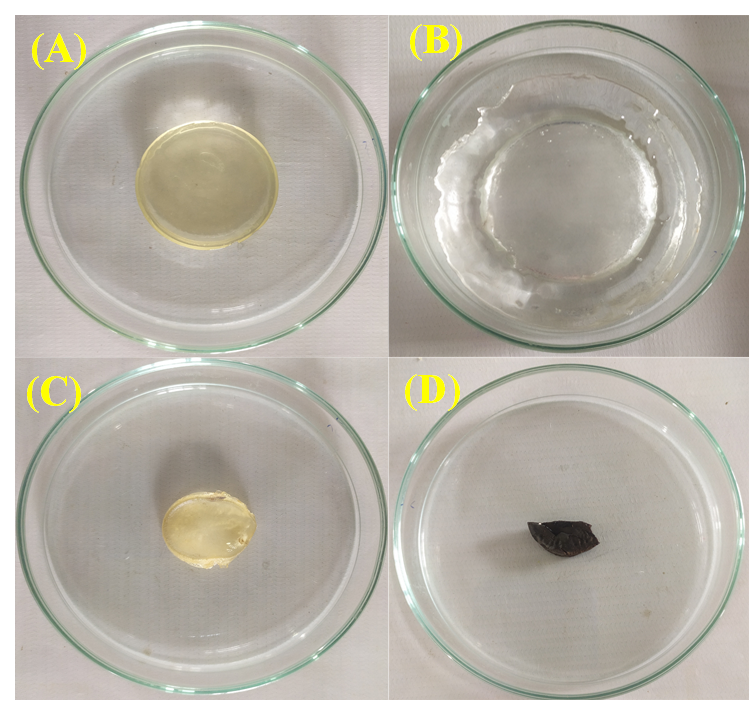
3 Research Institute of Cell Culture, Yeungnam University, 280 Daehak-Ro, Gyeongsan, Gyeongbuk 38541, South Korea [sunmizo@ynu.ac.kr](mailto:sunmizo@ynu.ac.kr) (S.Z.) ; [sshan@yu.ac.kr](mailto:sshan@yu.ac.kr) (S.S.H.)

**\*** Correspondence: ksvkr@yogivemanauniversity.ac.in; Tel: +919704278890 (K.S.V.K.R). [msraochem@gmail.com](mailto:msraochem@gmail.com) (K.M.R.)



**Figure S1:** 1HNMR spectroscopy of pure tamarind gum polysaccharide

The TMG polysaccharide was isolated from TM seeds and confirmed by 1HNMR spectroscopy using D2O as a solvent. The characterization peaks for TM showed a narrow region at 4.4 to 3.3 ppm indicating the anomeric proton peaks of the glucose, xylose, and galactose backbone.



**Figure S2:** Digital photographic images of TMGA hydrogels (A) Fresh gel (B) Swollen gel (C) dried gel (D) TMGA-Ag hydrogel

**Table S1:** **In-vitro drug release data of TMGA hydrogel**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time (h)** | **pH-1.2 (%)** | | **pH-7.4 (%)** | |
|  | **TMGA-3** | **TMGA-4** | **TMGA-3** | **TMGA-4** |
| 3 | 35.31 | 26.68 | 48.88 | 32.40 |
| 5 | 53.41 | 33.42 | 63.51 | 49.58 |
| 7 | 61.74 | 47.09 | 75.25 | 65.91 |
| 12 | 72.12 | 71.46 | 84.23 | 84.23 |
| 24 | 89.27 | 84.16 | 95 | 88.68 |
| 48 | 93.12 | 85.12 | 97.72 | 91.02 |

**Table-S2:** Drug release kinetics of various kinetics models

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample code** | **Zero order** | | **First order** | | **Higuchi** | | **Hixson-Crowell** | | **Korsmeyer- peppas** | | | | | |
| **pH-1.2** | | | **pH-7.4** | | |
| ***R*** | ***K0*** | ***R*** | ***K1*** | ***R*** | ***Kh*** | ***R*** | ***Khc*** | ***k*** | ***n*** | ***r*** | ***k*** | ***n*** | ***r*** |
| **TMGA-1** | 0.982 | 2.215 | 0.978 | 2.145 | 0.991 | 0.102 | 0.963 | 1.215 | 2.51 | 0.98 | 0.977 | 2.33 | 0.64 | 0.984 |
| **TMGA -2** | 0.965 | 4.325 | 0.961 | 3.215 | 0.997 | 0.295 | 0.980 | 1.784 | 1.33 | 0.79 | 0.994 | 3.56 | 0.95 | 0.984 |
| **TMGA -3** | 0.989 | 1.849 | 0.988 | 1.478 | 0.974 | 0.380 | 0.991 | 1.235 | 2.35 | 0.67 | 0.981 | 1.47 | 0.91 | 0.991 |
| **TMGA -4** | 0.978 | 3.457 | 0.977 | 1.213 | 0.964 | 1.264 | 0.974 | 0.984 | 2.14 | 0.78 | 0.995 | 4.12 | 0.76 | 0.986 |