This data article contains two figures and one table supporting the research article entitled: "Continuous harvest of stem cells via partial detachment from thermoresponsive nanobrush surfaces"

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detachment from thermoresponsive nanobrush surface” [1]. The table shows coating conditions of three copolymers, poly(styrene-co-acrylic acid) grafted with oligovitronectin, poly(styrene-co-N-isopropylacrylamide) and poly(styrene-co-polyethylene glycol methacrylate) to prepare thermoresponsive surface. XPS spectra show the nitrogen peak of the polystyrene surface coated with poly(styrene-co-acrylic acid) grafted with oligovitronectin. The surface coating density analyzed from sorption of poly(styrene-co-acrylic acid) grafted with oligovitronectin by UV–vis spectroscopy is also presented.

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**Specifications table**

| Subject area | Chemistry        |
|--------------|------------------|
| More specific subject area | Biomaterials |
| Type of data | Table, figure |
| How data was acquired | XPS, UV–vis spectroscopy |
| Data format | Analyzed |
| Experimental factors | Poly(styrene-co-acrylic acid) grafted with oligovitronectin was coated on tissue culture polystyrene dishes |
| Experimental features | See experimental details for each figure |
| Data source location | Taiwan |
| Data accessibility | Within this article |

**Value of the data**

- The data show coating conditions of three copolymers, poly(styrene-co-acrylic acid) grafted with oligovitronectin, poly(styrene-co-N-isopropylacrylamide) and poly(styrene-co-polyethylene glycol methacrylate) on polystyrene tissue culture plates for the preparation of thermoresponsive surface.
- The data show which concentration of the coating polymer is necessary to cover the surface.
- The data show the concentration of the coating polymer is necessary to cover the surface.
- The surface coating density can be measured by spectroscopy on the surface coated with poly(styrene-co-acrylic acid) grafted with oligovitronectin.
- The data show the evaluation of oligovitronectin measured by XPS spectra of the surface coated with poly(styrene-co-acrylic acid) grafted with oligovitronectin.
- The existence of oligovitronectin on the surface coated with poly(styrene-co-acrylic acid) can be verified by XPS measurement.

**Data**

Table 1 shows coating conditions of three copolymers, (a) poly(styrene-co-acrylic acid) grafted with oligovitronectin (P[St-AA]-oligoVN), (b) poly(styrene-co-N-isopropylacrylamide) (P[St-PNI-
PAAm) and (c) poly(styrene-co-polyethylene glycol methacrylate) (P[St-PEGMA]) to prepare thermoresponsive surface.

Table 1

Coating conditions of thermoresponsive surface used in this study.

| Coating conditions | Coating concentration (mg/ml) | Figure no. used in Ref. [1] |
|--------------------|-------------------------------|----------------------------|
|                    | P[St-AA] | P[St-PNIPAAm] | P[St-PEG] |
| 25% surface coverage of P[St-AA]-oligoVN | 0.750 | 0 | 0 | Fig. 4 A |
| 25% surface coverage of P[St-AA]-oligoVN with 1:0 = P[St-NIPAAm]: P[St-PEG] | 0.750 | 3.000 | 0 | Fig. 2A, 2D, 4A–D |
| 25% surface coverage of P[St-AA]-oligoVN with 9:1 = P[St-NIPAAm]: P[St-PEG] | 0.750 | 2.700 | 0.300 | Fig. 4B, 4 C, and 4D |
| 25% surface coverage of P[St-AA]-oligoVN with 4:1 = P[St-NIPAAm]: P[St-PEG] | 0.750 | 2.400 | 0.600 | Figs. 2A, C–E, 3, 4A–D |
| 25% surface coverage of P[St-AA]-oligoVN with 7:3 = P[St-NIPAAm]: P[St-PEG] | 0.750 | 2.100 | 0.900 | Fig. 2A and D |
| 25% surface coverage of P[St-AA]-oligoVN with 0:1 = P[St-NIPAAm]: P[St-PEG] | 0.750 | 0 | 3.000 | Fig. 2A, 4B–D |
| 50% surface coverage of P[St-AA]-oligoVN with 1:0 = P[St-NIPAAm]: P[St-PEG] | 1.500 | 3.000 | 0 | Fig. 4B–D |
| 50% surface coverage of P[St-AA]-oligoVN with 9:1 = P[St-NIPAAm]: P[St-PEG] | 1.500 | 2.700 | 0.300 | Fig. 4B–D |
| 50% surface coverage of P[St-AA]-oligoVN with 4:1 = P[St-NIPAAm]: P[St-PEG] | 1.500 | 2.400 | 0.600 | Fig. 4B–D |
| 50% surface coverage of P[St-AA]-oligoVN with 0:1 = P[St-NIPAAm]: P[St-PEG] | 1.500 | 0 | 3.000 | Fig. 4B–D |
| 75% surface coverage of P[St-AA]-oligoVN with 1:0 = P[St-NIPAAm]: P[St-PEG] | 2.250 | 3.000 | 0 | Fig. 4B–D |
| 75% surface coverage of P[St-AA]-oligoVN with 9:1 = P[St-NIPAAm]: P[St-PEG] | 2.250 | 2.700 | 0.300 | Fig. 4B–D |
| 75% surface coverage of P[St-AA]-oligoVN with 4:1 = P[St-NIPAAm]: P[St-PEG] | 2.250 | 2.400 | 0.600 | Fig. 4B–D |
| 75% surface coverage of P[St-AA]-oligoVN with 0:1 = P[St-NIPAAm]: P[St-PEG] | 2.250 | 0 | 3.000 | Fig. 4B–D |
| 100% surface coverage of P[St-AA]-oligoVN with 1:0 = P[St-NIPAAm]: P[St-PEG] | 3.000 | 3.000 | 0 | Fig. 4B–D |
| 100% surface coverage of P[St-AA]-oligoVN with 9:1 = P[St-NIPAAm]: P[St-PEG] | 3.000 | 2.700 | 0.300 | Fig. 4–D |
| 100% surface coverage of P[St-AA]-oligoVN with 4:1 = P[St-NIPAAm]: P[St-PEG] | 3.000 | 2.400 | 0.600 | Fig. 4–D, 5B–D, and 6 |
| 100% surface coverage of P[St-AA]-oligoVN with 0:1 = P[St-NIPAAm]: P[St-PEG] | 3.000 | 0 | 3.000 | Fig. 4–D |

Fig. 1 shows high-resolution X-ray photoelectron spectroscopy (XPS) spectra of the N1s peaks obtained on the surface of 0% (a), 25% (b), 50% (c), 75% (d), and 100% (e) of surface coverage of P[St-AA]-oligoVN where the surface coverage % of P[St-AA]-oligoVN is defined as % adsorption of [St-AA]-oligoVN on the surface from the saturated adsorption amount (500 μg/cm² for 100%, 375 μg/cm² for 75%, 250 μg/cm² for 50%, and 125 μg/cm² for 25%). Nitrogen atoms originated from oligoVN on the surface [(b)-(e)], whereas no nitrogen atoms were observed on the non-coated tissue culture polystyrene (TCPS) surface (a).

Fig. 2 shows dependence of surface coating density of P[St-AA]-oligoVN on the concentration of coating solution. Coating density was measured by the decrease of optical density of coating solution of P[St-AA]-oligoVN after immersion of TCPS plates into the coating solution.

1. Experimental design, materials and methods

We designed three types of coating copolymers: (a) a stem cell binding site, (b) a thermoresponsive site, and (c) a hydrophilic site. Hydrophobic polystyrene (PSt) was selected as the anchoring site of these three copolymers on the surface of TCPS. For this purpose, we synthesized
three copolymers (a) P[St-AA]-oligoVN having the stem cell binding site of oligoVN (amino acid sequence of KGGPQVTRGDVFTMP) [2], (b) P[St-NIPAAm] having thermoresponsive polyNIPAAm [3] and (c) P[St-PEGMA] having hydrophilic PEGMA to prepare thermoresponsive surface.

Fig. 1. High-resolution XPS spectra of the N1s peaks obtained on the surface of 0% (a), 25% (b), 50% (c), 75% (d), and 100% (e) of surface coverage of P[St-AA]-oligoVN. Nitrogen atoms originated from oligoVN on the surface [(b)–(e)], whereas no nitrogen atoms were observed on the non-coated TCPS surface (a).

Fig. 2. Dependence of coating density of P[St-AA]-oligoVN on the concentration of coating solution. Coating density was measured by the decrease of optical density of coating solution of P[St-AA]-oligoVN after immersion of TCPS plates into the solution.
1.1. Synthesis of copolymers

P[St-AA], P[St-NIPAAm], and P[St-PEGMA] were prepared by a reversible addition-fragmentation chain transfer (RAFT) polymerization. The synthesis method of these copolymers was described in Ref. [1] in detail.

1.2. Preparation process of thermoresponsive nanobrush surface

0–3 mg/mL of P[St-AA] in ethanol was added in TCPS dishes (4 cm² of surface area, 12 well dishes) for coating of P[St-AA] on the surface for 2 h at 25 °C and subsequently removed from the dishes. TCPS dishes coated with P[St-AA] were activated via immersion in an aqueous solution containing 10 mg/ml N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide hydrochloride (EDC) and 10 mg/ml N-hydroxysuccinimide (NHS) for 1 h at 37 °C after washing the dishes with phosphate buffered saline (PBS, pH 7.2) three times [1,4,5]. Subsequently, the dishes were washed with PBS and immersed in a PBS solution containing 1000 μg/mL of oligoVN for 24 h at 4 °C to prepare P[St-AA]-oligoVN dishes. The dishes were washed with PBS three times [1].

1.3. Characterization of dishes by XPS

The chemical composition of the dishes on the TCPS surface with P[St-AA]-oligoVN was analyzed using X-ray photoelectron spectroscopy (XPS, K-Alpha spectrometer, Thermal Scientific, Inc., Amarillo, TX, USA, equipped with a monochromatic Al-K X-ray source [1486.6 eV photons]). The energy of the emitted electrons was measured using a hemispherical energy analyzer at pass energies ranging from 50 to 150 eV. Data were collected at a photoelectron takeoff angle of 45° with respect to the sample surface. The binding energy (BE) scale was referenced by setting the peak maximum in the C1s spectrum to 284.6 eV. The obtained high-resolution C1s spectra were fitted using Shirley background subtraction and a series of Gaussian peaks [1,5].

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Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2015.12.056.

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