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## A Janus-paper PDMS platform for air-liquid interface cell culture applications

By: [Rahimi, R](#) (Rahimi, Rahim)<sup>[1,2]</sup>; [Ochoa, M](#) (Ochoa, Manuel)<sup>[1,2]</sup>; [Donaldson, A](#) (Donaldson, Amy)<sup>[3]</sup>; [Parupudi, T](#) (Parupudi, Tejasvi)<sup>[1,2]</sup>; [Dokmeci, MR](#) (Dokmeci, Mehmet R.)<sup>[4,5]</sup>; [Khademhosseini, A](#) (Khademhosseini, Ali)<sup>[4,5,6,7,8,9]</sup>; [Ghaemmaghami, A](#) (Ghaemmaghami, Amir)<sup>[3]</sup>; [Ziaie, B](#) (Ziaie, Babak)<sup>[1,2]</sup>

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### Abstract

A commercially available Janus paper with one hydrophobic (polyethylene-coated) face and a hygroscopic/hydrophilic one is irreversibly bonded to a polydimethylsiloxane (PDMS) substrate incorporating microfluidic channels via corona discharge surface treatment. The bond strength between the polymer-coated side and PDMS is characterized as a function of corona treatment time and annealing temperature/time. A maximum strength of 392 kPa is obtained with a 2 min corona treatment followed by 60 min of annealing at 120 degrees C. The water contact angle of the corona-treated polymer side decreases with increased discharge duration from 98 degrees to 22 degrees. The hygroscopic/hydrophilic side is seeded with human lung fibroblast cells encapsulated in a methacrylated gelatin (GelMA) hydrogel to show the potential of this technology for nutrient and chemical delivery in an air-liquid interface cell culture.

### Keywords

**Author Keywords:** [paper](#); [rapid prototyping](#); [PDMS bonding](#); [cell culture](#); [air-liquid interface](#)

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### Author Information

**Reprint Address:** [Rahimi, R](#) (reprint author)

+ [Purdue Univ, Birck Nanotechnol Ctr, W Lafayette, IN 47907 USA.](#)

#### Addresses:

- + [ 1 ] [Purdue Univ, Birck Nanotechnol Ctr, W Lafayette, IN 47907 USA](#)
- + [ 2 ] [Purdue Univ, Sch Elect & Comp Engn, W Lafayette, IN 47907 USA](#)
- + [ 3 ] [Univ Nottingham, Fac Med & Hlth Sci, Cellular Immunol & Tissue Modeling Grp, Div Immunol,Sch Life Sci,Queens Med Ctr, Nottingham NG7 2UH, England](#)
- + [ 4 ] [Harvard MIT Hlth Sci & Technol, Cambridge, MA USA](#)
- + [ 5 ] [Harvard Univ, Brigham & Womens Hosp, Biomaterials Innovat Res Ctr, Div Biomed Engn,Dept Med,Med Sch, Cambridge, MA 02139 USA](#)
- + [ 6 ] [Harvard Univ, Wyss Inst Biol Inspired Engn, Boston, MA 02115 USA](#)
- + [ 7 ] [Kyung Hee Univ, Sch Dent, Dept Maxillofacial Biomed Engn, Seoul 130701, South Korea](#)
- + [ 8 ] [Kyung Hee Univ, Sch Dent, Inst Oral Biol, Seoul 130701, South Korea](#)
- + [ 9 ] [King Abdulaziz Univ, Dept Phys, Jeddah 21569, Saudi Arabia](#)

**E-mail Addresses:** [bziaie@purdue.edu](mailto:bziaie@purdue.edu)

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