Supporting Information

Engineered Interaction Between Short Elastin-Like Peptides and Perfluorinated Sulfonic-acid Ionomer

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Quartz Crystal Microbalance with Dissipation (QCM-D) Data:

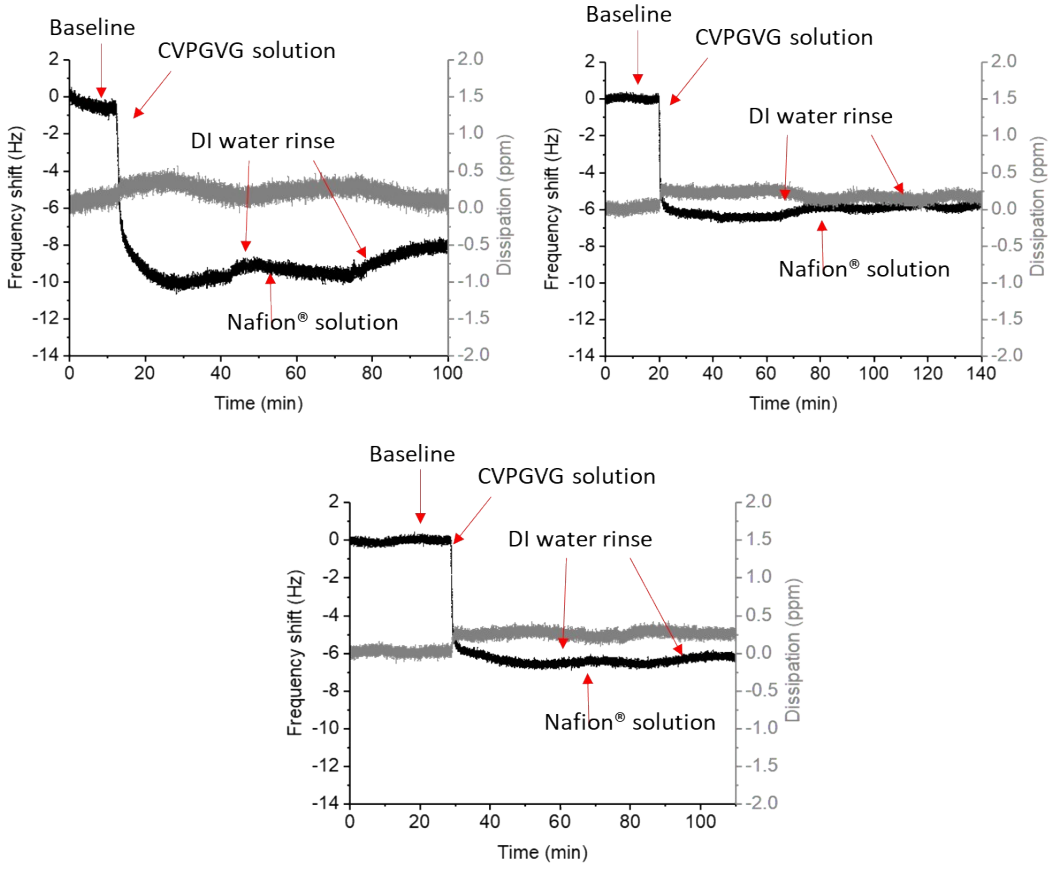


Figure S1: Frequency (black) and dissipation (gray) monitoring of CVPGVG peptide and Nafion® solutions on a gold sensor. Each plot represents one of three separate repeats.

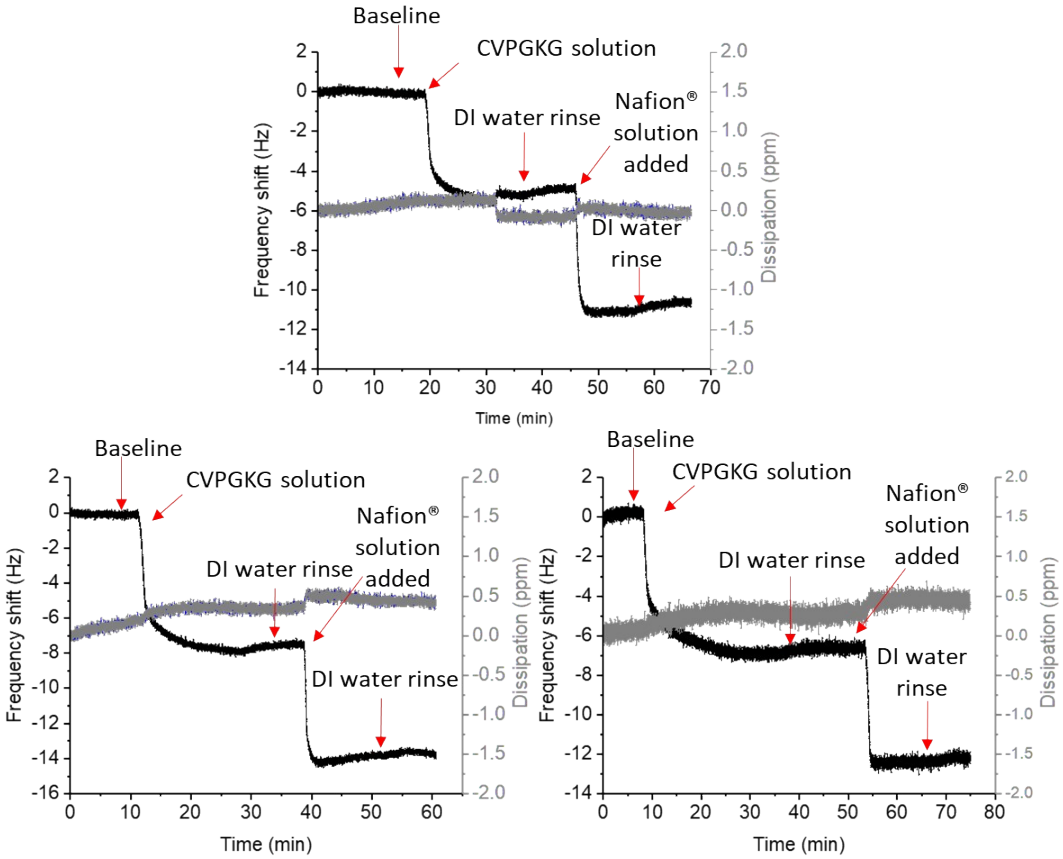


Figure S2: Frequency (black) and dissipation (gray) monitoring of CVPGKG peptide and Nafion® solutions on a gold sensor. Each plot represents one of three separate repeats.

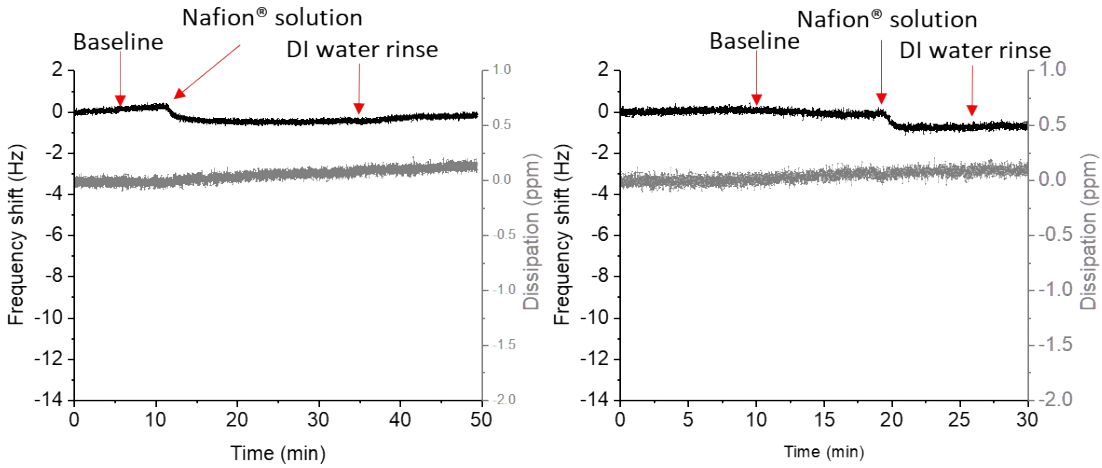


Figure S3: Frequency (black) and dissipation (gray) monitoring of Nafion® solution on a gold sensor.

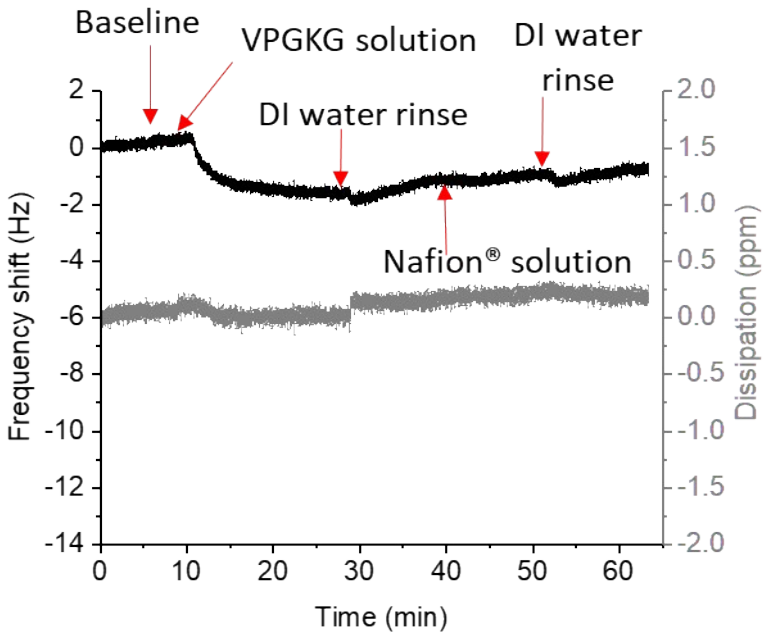


Figure S4：Frequency (black) and dissipation (gray) monitoring of VPGKG peptide and Nafion® solution on a gold sensor.

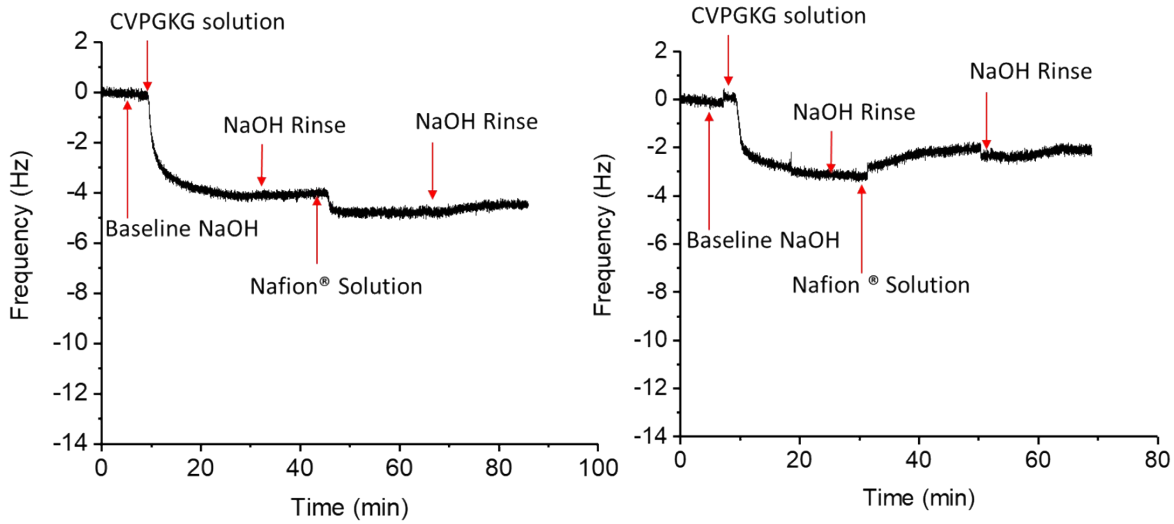
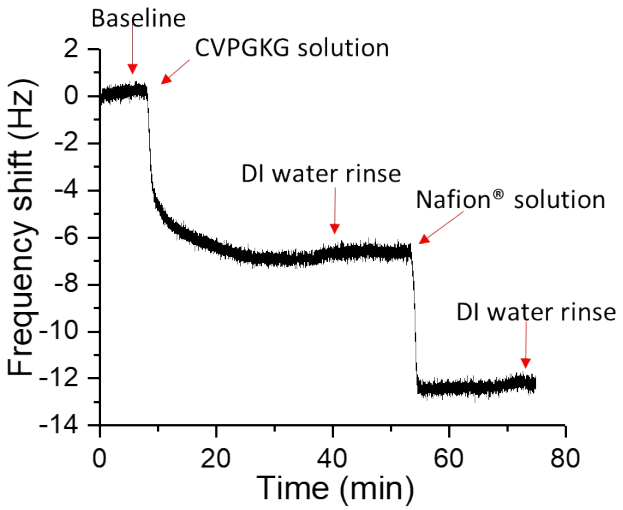


Figure S5：Frequency monitoring of CVPGKG peptide and Nafon® solution on a gold sensor in 10 mM NaOH aqueous solution (pH=12).

QCM-D Data Reduction:

Q-Sense Dfind was used to calculate mass increase for each repeat (shown above). The average of data taken in the rinse sections was used to calculate mass as shown in the example below:



Frequency monitoring of CVPGKG and Nafion® solution on a gold sensor.

Time period (min)	Average mass (ng/cm^2)
0-10	0
40-50	118.48
65-75	221.96

The mass for each repeat was used to calculate the final average mass and standard deviation (n=3). Based on Sauerbrey equation:

$$\Delta m = -\frac{C\Delta f}{n} \tag{1}$$

where n is the overtone number and C is a constant of 17.7 $ng \cdot cm^{-2} \cdot Hz^{-1}$ for a 5 MHz crystal.

Thickness is calculated with the following equation:

$$T = \frac{\Delta m}{d} \tag{2}$$

where T is the thickness of the film, Δm is the change in mass per unit area calculated by the Sauerbrey equation, and d is the density of the film materials, we assume the density of our peptide layer is 1.1g/cm^{-3} (value obtained from Q-Sense Software) and the Nafion® layer is 1.4g/cm^{-3} (value obtained from Zook, L. A.; Leddy, J., Density

and solubility of nafion: Recast, annealed, and commercial films. Anal. Chem. 1996, 68, (21), 3793-3796).

X-ray Photoelectron Spectroscopy (XPS) Analysis:

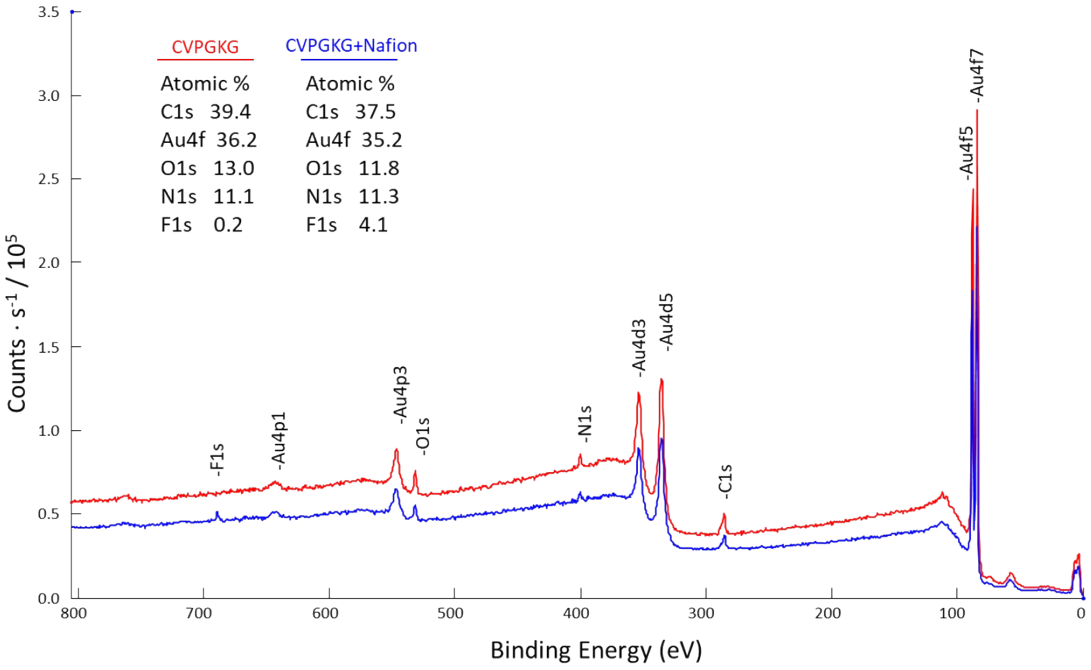


Figure S6: XPS data showing (red) lack of fluorine in the CVPGKG peptide coated sensor and (blue) the presence of fluorine in CVPGKG peptide exposed to Nafion®. One sensor for each group (CVPGKG and CVPGKG + Nafion) was prepared via QCM-D and analyzed via XPS (n=1).

Atomic Force Microscopy (AFM) Analysis:

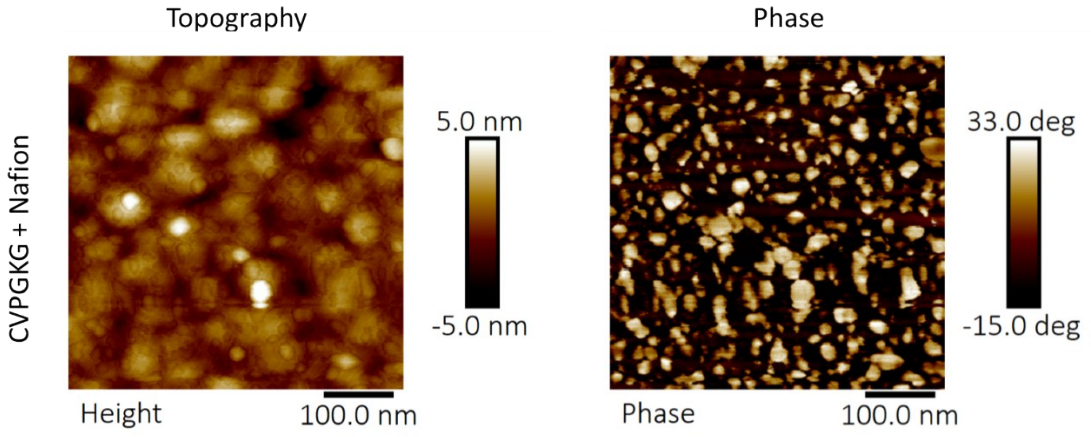


Figure S7: Second set of AFM data showing topography and phase image of a gold

sensor coated in the CVPGKG peptide and Nafion® prepared by QCM-D. The first set of data is shown in Figure 3 of the main text.

Fourier-transform infrared spectroscopy (FTIR) Analysis:

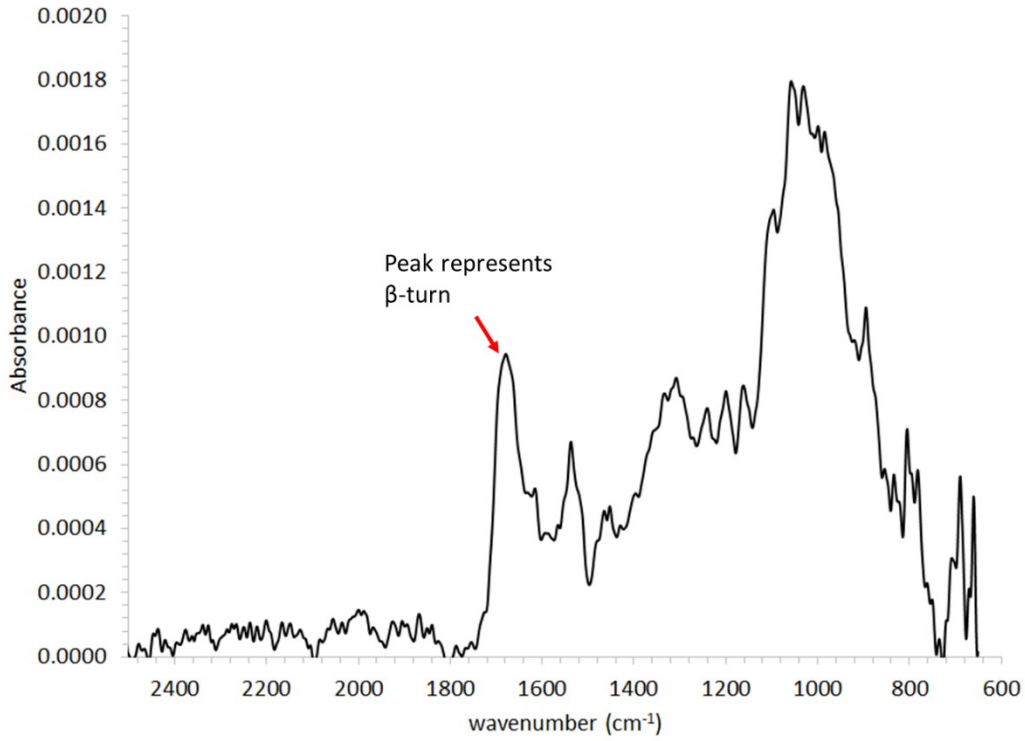


Figure S8: Fourier-transform infrared spectroscopy of CVPGKG peptide coated gold sensor. The peak at 1679 cm^{-1} represents a β-turn structure of CVPGKG peptide after deposited on gold sensor.