

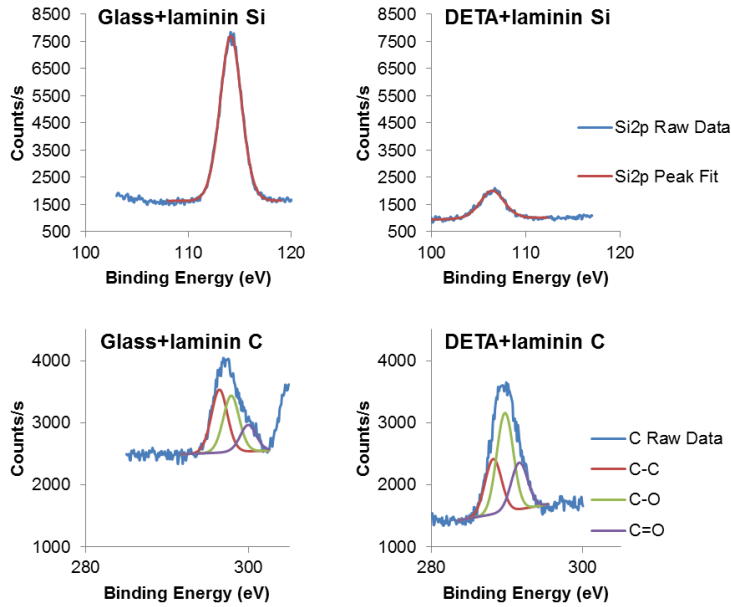
## Supplemental Materials

Resting membrane potential (mV)	Control	-48.5 ± 2.0 (21)	Spontaneous activity (Hz)	Control	2.0 ± 0.3 (15)
	10 nM Aβ acute	-48.2 ± 2.4 (16)		10 nM Aβ acute	1.4 ± 0.2 (13)
	10 nM Aβ chronic	-44.9 ± 1.4 (32)		10 nM Aβ chronic	*0.2 ± 0.2 (17)
	5 μM Aβ acute	*-43.5 ± 1.3 (23)		5 μM Aβ acute	**0.0 ± 0.7 (21)
Membrane resistance (MΩ)	Control	531 ± 89 (22)	FWHM (ms)	Control	2.7 ± 0.2 (28)
	10 nM Aβ acute	442 ± 51 (16)		10 nM Aβ acute	2.0 ± 0.2 (11)
	10 nM Aβ chronic	488 ± 35 (32)		10 nM Aβ chronic	2.5 ± 0.2 (23)
	5 μM Aβ acute	451 ± 103 (31)		5 μM Aβ acute	*3.8 ± 0.4 (22)
Membrane capacitance (pF)	Control	26.6 ± 2.4 (22)	Rise time (ms)	Control	2.9 ± 0.1 (28)
	10 nM Aβ acute	26.0 ± 2.2 (16)		10 nM Aβ acute	2.8 ± 0.1 (11)
	10 nM Aβ chronic	27.8 ± 1.8 (32)		10 nM Aβ chronic	3.0 ± 0.1 (23)
	5 μM Aβ acute	33.5 ± 2.0 (31)		5 μM Aβ acute	*3.5 ± 0.2 (22)
Maximum inward current (pA)	Control	-3802 ± 403 (22)	V <sub>max</sub> (mV/ms)	Control	119.8 ± 8.8 (31)
	10 nM Aβ acute	-2855 ± 329 (13)		10 nM Aβ acute	132.2 ± 10.5 (16)
	10 nM Aβ chronic	-2802 ± 241 (30)		10 nM Aβ chronic	125.9 ± 12.6 (24)
	5 μM Aβ acute	*-1874 ± 179 (30)		5 μM Aβ acute	*82.4 ± 6.0 (24)
Maximum outward current (pA)	Control	1965 ± 177 (22)	Decay slope (mV/ms)	Control	2.3 ± 0.1 (31)
	10 nM Aβ acute	1573 ± 184 (13)		10 nM Aβ acute	2.8 ± 0.2 (16)
	10 nM Aβ chronic	1551 ± 134 (30)		10 nM Aβ chronic	2.2 ± 0.1 (24)
	5 μM Aβ acute	*1324 ± 203 (30)		5 μM Aβ acute	0.0 ± 0.7 (21)
AP amplitude (mV)	Control	105.3 ± 4.2 (18)	Decay time (ms)	Control	5.2 ± 1.0 (31)
	10 nM Aβ acute	102.5 ± 2.7 (14)		10 nM Aβ acute	3.1 ± 1.1 (16)
	10 nM Aβ chronic	107.9 ± 2.9 (22)		10 nM Aβ chronic	3.9 ± 0.9 (23)
	5 μM Aβ acute	*101.1 ± 7.8 (20)		5 μM Aβ acute	2.9 ± 0.6 (24)

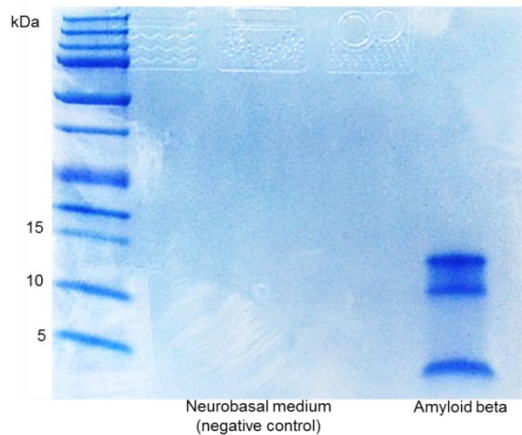
**Supplemental Table 1.** Data shown as mean values ± SE (no. cells analyzed). One-way analysis of variance (ANOVA) tests were performed as described in Materials and Methods. \*Significant difference at  $p < 0.05$ ; \*\*Significant difference at  $p < 0.001$ .

Vendor	Component	Catalog #	Quantity
Invitrogen	Neurobasal®-A	10888	500 mL
Invitrogen	B-27®	17504-044	1x
Invitrogen	GlutaMAX™	35050-061	1x
Invitrogen	Antibiotic/Antimycotic	15240-096	1%
Cell Sciences	BDNF, recombinant human	CRB600B	20 ng/mL
Cell Sciences	NT-3, recombinant human	CRN500B	20 ng/mL
Sigma	Insulin-like Growth Factor	I2656	20 ng/mL
Fisher Scientific	Adjust osmolarity with NaCl	S671-3	297 mOsm final

**Supplemental Table 2.** HSL1 medium was designed to promote the long-term survival and maturation of hippocampal neurons *in vitro*.



**Supplemental Figure 1. XPS analysis of laminin on glass vs. laminin on DETA.** XPS analysis of laminin on DETA-modified glass and unmodified glass. The carbonyl peak, which is indicative of protein for these samples, is smaller on glass than on DETA-modified glass relative to the underlying substrate (Si).



**Supplemental Figure 2. Amyloid beta oligomerization gel electrophoresis and coomassie blue stain.** Pure oligomerized samples of Aβ were run on 10-20% tris-tricine gels and stained to visualize protein bands. Only low molecular weight bands were present.