

Poly (I:C)-induced maternal immune activation modifies ventral hippocampal regulation of stress reactivity: prevention by environmental enrichment

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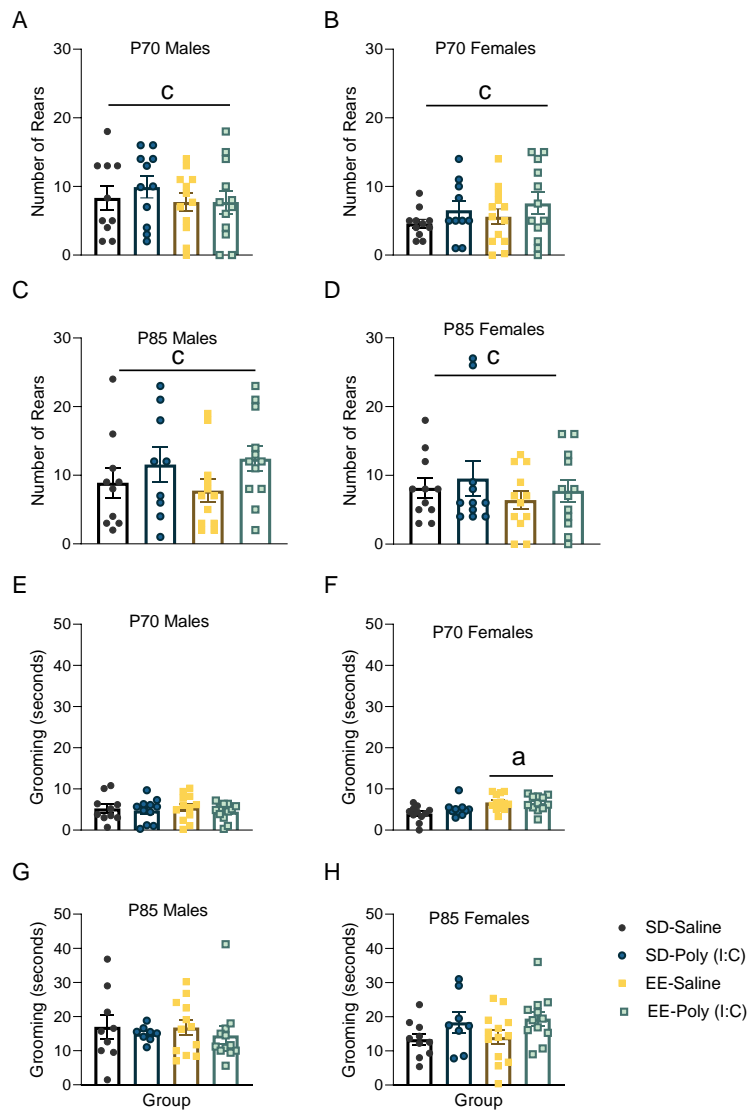
Supplementary Materials

Supplementary Figure S1

Supplementary Table S2

Supplementary Table S3

Supplementary Figure S1. The effects of maternal immune activation (MIA) and environmental enrichment on P70 offspring open field and P85 social investigation rearing and grooming behaviors. Postnatal day (P) 70 open field data on the number of rears for (A) male and (B) female mice. P85 data on the number of rears for (C) male and (D) female mice during the social exposure. Grooming behavior (seconds) in (E) males and (F) females during the P70 open field test and in (G) males and (H) females during the P85 social exposure. Data are expressed as Mean \pm SEM, n=8-14 litters represented per sex, MIA, and housing group. ^ap < 0.05, main effect of housing; ^cp < 0.05, main effect of sex.



Supplementary Table S2. Litter Designations and Treatments.

Number of Dams Included in Maternal Measures	Number of Offspring Included in P70 Behavioral Analyses	Number of Offspring Included in P85 Behavioral Analyses	Number of Offspring Included in qPCR Analyses	Number of Offspring Included in cFos Analyses
SD-Saline; (n = 12) [†]	11 Males; 10 Females [#]	9 Males [#] ; 11 Females	8 Males; 8 Females	7-8 Males; 9 Females
SD-Poly (I:C); (n = 14) [†]	11 Males [#] ; 10 Females [*]	12 Males [*] ; 10 Females [*]	8 Males; 8 Females	7-8 Males; 7-8 Females
EE-Saline; (n = 12)	12 Males; 13 Females [*]	10 Males [#] ; 13 Females [*]	8 Males; 8 Females	7-8 Males; 6-7 Females
EE-Poly (I:C); (n = 12)	12 Males; 12 Females	12 Males; 12 Females	8 Males; 8 Females	7-8 Males; 7-8 Females
N = 50 dams; N = 93 offspring	N = 91	N = 89	N = 64	N = 58-64

Note: 65 dams were bred. 8 dams lost their litters during pregnancy or had small litters (n < 4 pups) that were fostered to same age and group matched dams. These issues were primarily in the SD-Poly (I:C) group. 7 dams did not become pregnant.

[#]Animal not evaluated on behavioral measure due to experimenter error or video recording failure.

[†] Litter lost after birth.

^{*}Extra pups in litter represent fostered animals.

Supplementary Table S3. mRNA gene expression in offspring exposed to maternal immune activation and housed in SD or EE

Brain region	Sex	Neural marker	SD		EE	
			Saline	Poly (I:C)	Saline	Poly (I:C)
Prefrontal Cortex	Males	<i>Crh</i> **	1.00 ± 0.12	1.64 ± 0.30	0.85 ± 0.08	1.30 ± 0.28
		<i>Crhr1</i> **	1.00 ± 0.08	1.30 ± 0.11	1.17 ± 0.11	1.39 ± 0.05
		<i>Nr3c1</i> ##	1.00 ± 0.09	1.36 ± 0.13	0.76 ± 0.08	0.96 ± 0.16
		<i>Oxt</i> †	1.00 ± 0.05	1.07 ± 0.34	0.56 ± 0.18 ^a	1.08 ± 0.26
		<i>Avpr1a</i>	1.00 ± 0.63	2.85 ± 1.10	1.56 ± 0.61	1.66 ± 0.57
		<i>Oxytr</i>	1.00 ± 0.15	1.31 ± 0.18	0.97 ± 0.20	1.04 ± 0.13
	Females	<i>Crh</i>	1.00 ± 0.20	0.86 ± 0.07	0.77 ± 0.07	0.73 ± 0.11
		<i>Crhr1</i> **##	1.00 ± 0.10	0.89 ± 0.04	1.51 ± 0.04	1.13 ± 0.07
		<i>Oxt</i>	1.00 ± 0.34	0.63 ± 0.19	0.76 ± 0.32	0.44 ± 0.13
		<i>Avpr1a</i>	1.00 ± 0.27	1.37 ± 0.36	0.97 ± 0.374	1.35 ± 0.40
		<i>Oxytr</i>	1.00 ± 0.18	0.68 ± 0.06	0.84 ± 0.14	0.62 ± 0.06
		<i>Nr3c1</i> ##	1.00 ± 0.09	1.15 ± 0.07	0.84 ± 0.07	0.80 ± 0.12
Ventral Hippocampus	Males	<i>Crh</i> ††	1.00 ± 0.08	2.71 ± 0.397 ^{ab}	2.00 ± 0.27 ^{ab}	1.18 ± 0.14
		<i>Crhr1</i> ††	1.00 ± 0.10	1.69 ± 0.116 ^{ab}	0.96 ± 0.17	0.85 ± 0.17
		<i>Nr3c1</i> †††	1.00 ± 0.05	2.88 ± 0.16 ^{ab}	1.69 ± 0.10 ^a	1.32 ± 0.26
		<i>Oxt</i>	1.00 ± 0.45	0.88 ± 0.12	1.01 ± 0.35	0.89 ± 0.22
		<i>Avpr1a</i> †	1.00 ± 0.20	2.05 ± 0.38 ^a	2.25 ± 0.58	1.70 ± 0.26
		<i>Oxytr</i> ††	1.00 ± 0.12	2.13 ± 0.29 ^{ab}	1.37 ± 0.27	1.34 ± 0.19
		<i>Camk2a</i> †	1.00 ± 0.09	1.68 ± 0.16 ^{ab}	1.07 ± 0.06	1.24 ± 0.11
		<i>Prkca</i> ††	1.00 ± 0.05	2.91 ± 0.19 ^{ab}	1.79 ± 0.15 ^a	1.44 ± 0.28
	Females	<i>Crh</i> †	1.00 ± 0.21	1.36 ± 0.07 ^b	0.84 ± 0.11	0.61 ± 0.05
		<i>Crhr1</i>	1.00 ± 0.10	1.68 ± 0.32	1.61 ± 0.36	1.75 ± 0.19
		<i>Nr3c1</i>	1.00 ± 0.20	1.13 ± 0.10	0.94 ± 0.08	0.63 ± 0.03
		<i>Oxt</i>	1.00 ± 0.18	0.84 ± 0.18	0.61 ± 0.15	0.40 ± 0.07
		<i>Avpr1a</i>	1.00 ± 0.26	1.75 ± 0.46	1.18 ± 0.11	1.04 ± 0.20
		<i>Oxytr</i> ††	1.00 ± 0.15	0.61 ± 0.06 ^{ab}	0.76 ± 0.10	0.97 ± 0.10
Hypothalamus	Males	<i>Crh</i>	1.00 ± 0.14	1.01 ± 0.43	1.24 ± 0.63	1.32 ± 0.45
		<i>Crhr1</i>	1.00 ± 0.24	1.49 ± 0.54	0.49 ± 0.07	1.44 ± 0.30
		<i>Nr3c1</i>	1.00 ± 0.27	2.18 ± 0.80	2.08 ± 0.83	1.36 ± 0.28
		<i>Oxt</i>	1.00 ± 0.18	1.98 ± 0.95	2.86 ± 1.86	1.93 ± 0.47
		<i>Avpr1a</i>	1.00 ± 0.13	0.51 ± 0.30	0.97 ± 0.42	1.02 ± 0.35
		<i>Oxytr</i>	1.00 ± 0.22	1.41 ± 0.28	1.12 ± 0.25	1.20 ± 0.25
		Females	<i>Crh</i>	1.00 ± 0.15	4.52 ± 2.02	2.91 ± 1.32
	<i>Crhr1</i>		1.00 ± 0.63	0.25 ± 0.07	0.15 ± 0.09	0.25 ± 0.05
	<i>Nr3c1</i>		1.00 ± 0.26	1.60 ± 0.56	1.64 ± 0.85	0.77 ± 0.19
	<i>Oxt</i>		1.00 ± 0.17	1.03 ± 0.23	1.63 ± 0.55	1.54 ± 0.52
	<i>Avpr1a</i>		1.00 ± 0.16	2.01 ± 0.53	1.34 ± 0.47	0.92 ± 0.16
	<i>Oxytr</i>		1.00 ± 0.17	0.58 ± 0.11	0.86 ± 0.22	0.93 ± 0.15

Data are mean ± SEM.

† P<0.05, significant interaction (MIA x Housing)

* P<0.05, ** P<0.01, significant main effect of MIA (saline vs. poly (I:C))

P<0.05, ## P<0.01, significant main effect of housing (SD vs. EE)

Lower case letters indicate significant differences between conditions (^adifferent from SD-Saline, ^bdifferent from EE-Poly (I:C))