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Supplementary Information for

Interference of Bisphenol A on Cumulus Cells Development and Number of Retrieved Mature Oocytes in Unexpected Poor Ovarian Response Women: A Prospective Cohort Study

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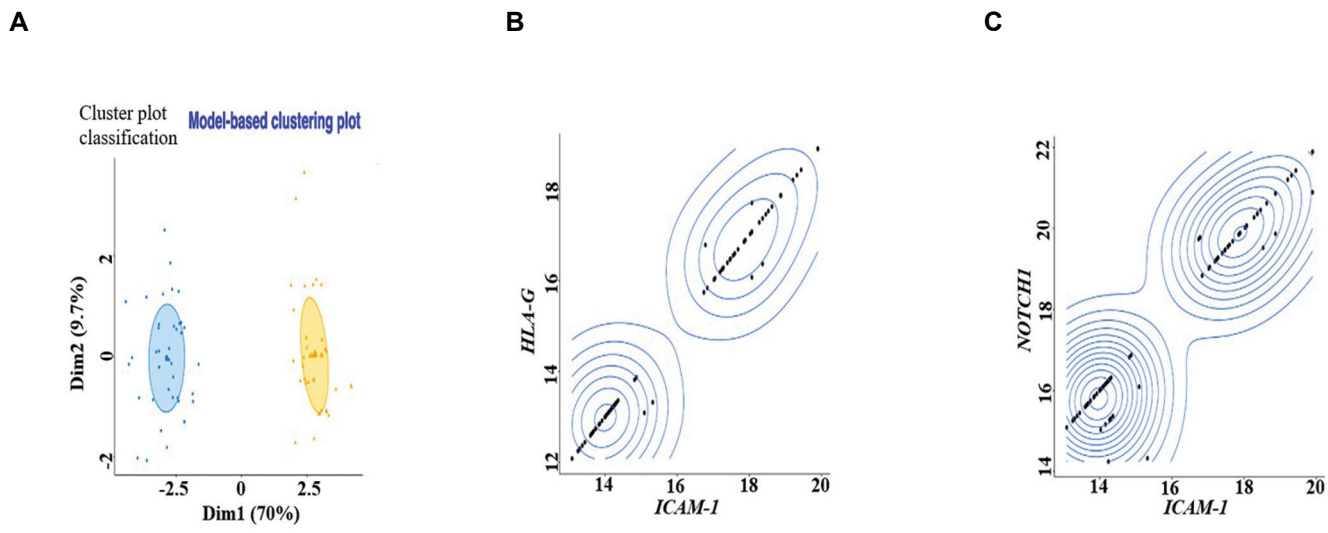

Fig.S1: The K-mean classification results. **A.** Representative model-based clustering results of paired-sample gene expression data in two groups of women. **B, C.** Interaction of *ICAM-1* with *HLA-G* and *NOTCH-1* gene expression.

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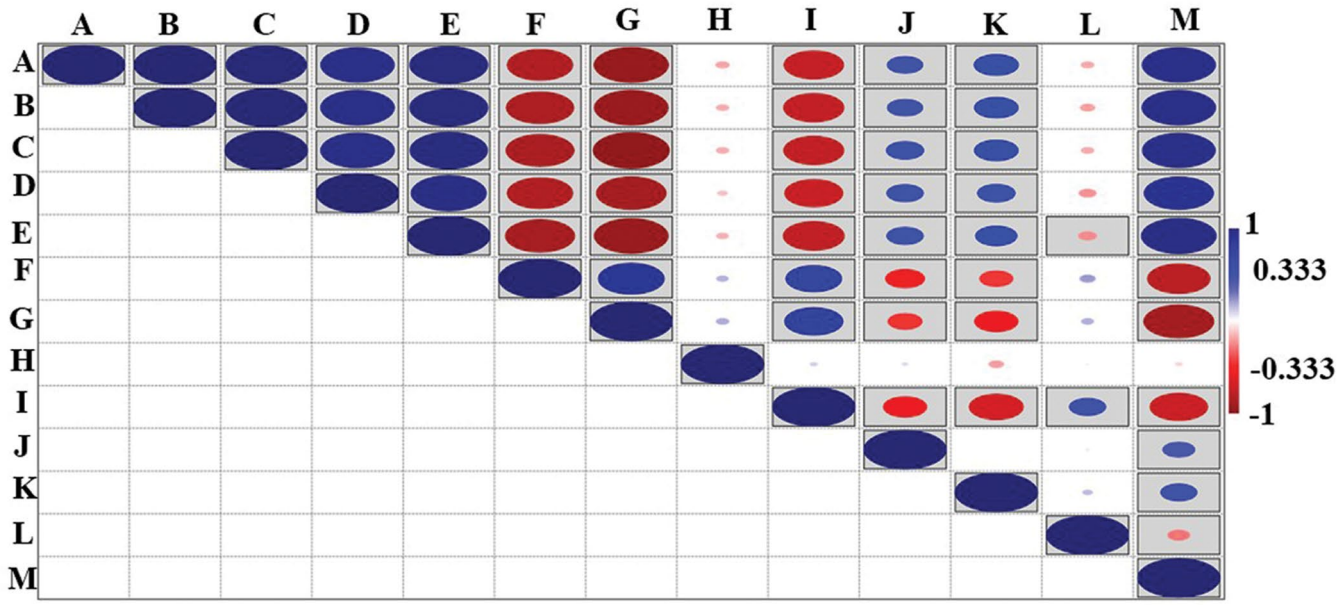

Fig.S2: Pair-wise correlations between different variants studied. A; *NOTCH1,* B; *NOTCH2,* C; *NOTCH3,* D*; CASPASE-3,* E; *CASPASE-7,* F; *HLA-G,* G; *ICAM-1* gene expression, and M; BPA concentration. Blue circle shows a positive correlation (r>1), the red circle shows a negative correlation (r<-1), and gray squares show a significant correlation (P<0.05).

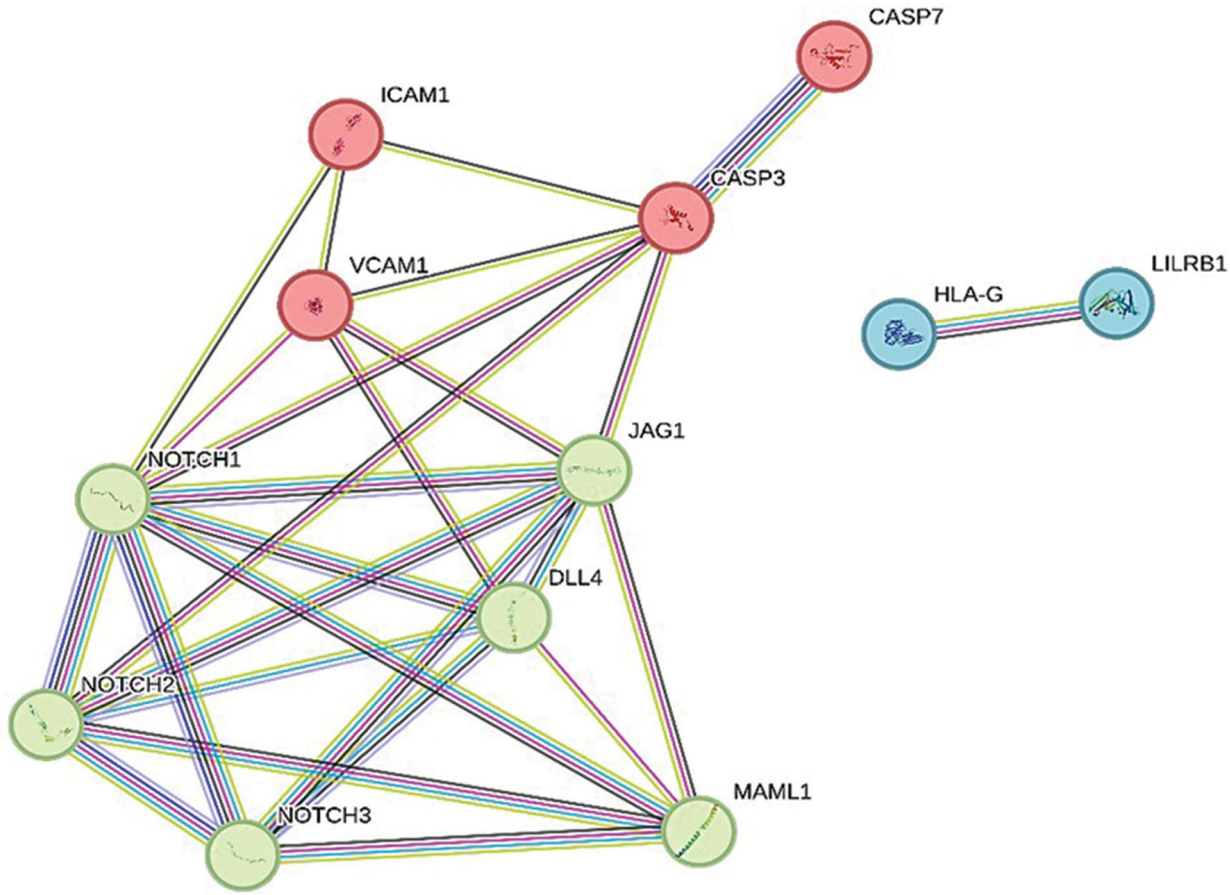

Fig.S3: K mean clustering based on PPI enrichment using STRING software. Each cluster is in a different color. PPI; Protein-protein interaction.

Table S1: Interaction between nodes annotations, and their score of protein network

Node1	Node2	Node1 accession	Node2 accession	Node1 annotation	Node2 annotation	Score
CASP3	CASP7	ENSP00000311032	ENSP00000358327	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	Caspase-7 subunit p11; Involved in the activation cascade of caspases responsible for apoptosis execution.	0.95
CASP3	ICAM1	ENSP00000311032	ENSP00000264832	Caspase-3 subunit p12; Involved in the activation cascade of of apoptosis it proteolytically cleaves poly (ADP-ribose) polymerase (PARP) at a '216-Asp-|-Gly-217' bond.	Intercellular adhesion molecule 1; ICAM proteins are ligands for the leukocyte adhesion protein LFA-1 (integrin alpha-L/ beta-2).	0.635
CASP3	NOTCH1	ENSP00000311032	ENSP00000498587	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.576
CASP3	NOTCH2	ENSP00000311032	ENSP00000256646	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.404
CASP7	CASP3	ENSP00000358327	ENSP00000311032	Caspase-7 subunit p11; Involved in the activation cascade of caspases responsible for apoptosis execution.	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	0.95
ICAM1	CASP3	ENSP00000264832	ENSP00000311032	Intercellular adhesion molecule 1; ICAM proteins are ligands for the leukocyte adhesion protein LFA-1 (integrin alpha-L/ beta-2).	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution. At the onset of apoptosis it proteolytic ally cleaves poly (ADP-ribose) polymerase (PARP) at a '216-Asp-|-Gly-217' bond.	0.635
ICAM1	NOTCH1	ENSP00000264832	ENSP00000498587	Intercellular adhesion molecule 1; ICAM proteins are ligands for the leukocyte adhesion protein LFA-1 (integrin alpha-L/ beta-2).	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.609
NOTCH1	CASP3	ENSP00000498587	ENSP00000311032	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	0.576

Table S1: Continued

Node1	Node2	Node1 accession	Node2 accession	Node1 annotation	Node2 annotation	Score
NOTCH1	ICAM1	ENSP00000498587	ENSP00000264832	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Intercellular adhesion molecule 1; ICAM proteins are ligands for the leukocyte adhesion protein LFA-1 (integrin alpha-L/ beta-2).	0.609
NOTCH1	NOTCH2	ENSP00000498587	ENSP00000256646	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.932
NOTCH1	NOTCH3	ENSP00000498587	ENSP00000263388	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Neurogenic locus notch homolog protein 3; Functions as a receptor for membrane-bound ligands Jagged1, Jagged2 and Delta1 to regulate cell-fate determination.	0.811
NOTCH2	CASP3	ENSP00000256646	ENSP00000311032	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Caspase-3 subunit p12; Involved in the activation cascade of caspases responsible for apoptosis execution.	0.404
NOTCH2	NOTCH1	ENSP00000256646	ENSP00000498587	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination. U	0.932
NOTCH2	NOTCH3	ENSP00000256646	ENSP00000263388	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	Neurogenic locus notch homolog protein 3; Functions as a receptor for membrane-bound ligands Jagged1, Jagged2 and Delta1 to regulate cell-fate determination.	0.777

Table S1: Continued

Node1	Node2	Node1 accession	Node2 accession	Node1 annotation	Node2 annotation	Score
NOTCH3	NOTCH1	ENSP00000263388	ENSP00000498587	Neurogenic locus notch homolog protein 3; Functions as a receptor for membrane-bound ligands Jagged1, Jagged2 and Delta1 to regulate cell-fate determination.	Neurogenic locus notch homolog protein 1; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.811
NOTCH3	NOTCH2	ENSP00000263388	ENSP00000256646	Neurogenic locus notch homolog protein 3; Functions as a receptor for membrane-bound ligands Jagged1, Jagged2 and Delta1 to regulate cell-fate determination.	Neurogenic locus notch homolog protein 2; Functions as a receptor for membrane-bound ligands Jagged-1 (JAG1), Jagged-2 (JAG2) and Delta-1 (DLL1) to regulate cell-fate determination.	0.777

Table S2: Univariate regression analysis for oocyte quality, embryo quality, and BPA concentration with *NOTCH-1, NOTCH-2, NOTCH-3, CASPASE3* and *CASPASE7, HLA-G* and *ICAM-1* gene expression

Characteristics	**Gene expression**						
	NOTCH-1	**NOTCH-2**	**NOTCH-3**	**CASPASE3**	**CASPASE7**	**HLA-G**	**ICAM-1**
	B SE P value	B SE P value	B SE P value	B SE P value	B SE P value	B SE P value	B SE P value
Oocyte quality	1.020 0.330 0.000	1.4 0.48 0.00	1.15 0.47 0.00	2.32 0.57 0.00	2.22 0.67 0.00	2.32 0.67 0.00	2.59 0.57 0.00
Embryo quality	6.940 1.110 0.000	6.04 1.38 0.00	6.30 1.96 0.00	8.21 1.78 0.00	8.34 1.23 0.00	7.53 1.16 0.00	7.23 1.33 0.00
BPA concentration	3.350 0.770 0.000	3.42 0.80 0.00	3.15 0.69 0.00	1.32 0.22 0.00	1.22 0.29 0.00	4.70 0.99 0.00	4.59 0.92 0.00

BPA; Bisphenol A, B; Unstandardized coefficient, and SE; Standard error.