

## 5-HTTLPR과 COMT 유전자 다형성과 성격 특성에 대한 연합연구\*

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### An Association Study of the 5-HTTLPR and COMT Genes Polymorphisms and Personality Traits \*

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#### ABSTRACT

**B**ackground : Serotonin transporter gene - linked polymorphism region(5 - HTTLPR) and catechol - O - methyltransferase(COMT) genes are thought to be important factors in some personality traits and the etiology of anxiety disorder. The goal of this study was to determine the role of these genes in personality traits.

**Method** : The participants included 116 healthy adults with no history of psychiatric disorders and other physical illness for the last 6 months. All participants were tested by Temperament and Character Inventory(TCI). The 5 - HTTLPR, COMT val158met gene polymorphisms were analyzed with PCR(Polymerase Chain Reaction). Differences on TCI dimensions and sub - scales among groups were examined with *t* - test and ANOVA.

**Result** : There were possible relationships of the 5 - HTTLPR with self - transcendence( $P=0.050$ ) and COMT val158met polymorphism with cooperativeness( $P=0.053$ ).

**Conclusion** : We found associations between 5 - HTTLPR, COMT polymorphisms and the some TCI character dimensions. Further studies of polymorphisms of other genes and their interactions may clarify the complex relationship between personality and genes.

**KEY WORDS** : Temperament and Character Inventory · 5 - HTTLPR · COMT · Personality traits · Genetic polymorphism.

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# 서 론

가 (Personality) 가

30~60%가<sup>1)</sup>

Cloninger<sup>2)</sup> Cloninger<sup>2)</sup> (temperament) (novelty seeking, NS), (harm avoidance, HA), (reward dependence, RD) 가

(persistence, PS) RD

4가<sup>3)</sup> Cloninger (dimension) (Self-directedness, SD), (Cooperativeness, CO) (Self-transcendence, ST) (Character) 가

Cloninger가

가

(serotonin transporter, 5-HTT),<sup>5)</sup> D2, D4<sup>6)</sup> catechol-O-methyltransferase (COMT)<sup>7)</sup>

5-HTT 1996 Lesch<sup>5)</sup>

HA

HA<sup>8)9)</sup> 가 NS D4

exon<sup>6)12)</sup>

D4<sup>13)14)</sup> Benjamin<sup>7)</sup> 5-HTTLPR COMT COMT

<sup>15)</sup> catechol-O-methyltransferase (COMT) COMT 가 5-HTTLPR COMT<sup>16)</sup> catechol-O-methyltransferase<sup>17)</sup>

COMT 가 5-HTTLPR CO-MT val158met

## 연구대상 및 방법

1. 연구대상
 

1 116

가

DSM- 가
2. 연구방법
  - 1) 유전자형 분석
 

(1) 10cc , DNA

(2) DNA 1.5ml 13,000rpm 1 ACE shocking

(NH<sub>4</sub>Cl 8g, Na<sub>2</sub>EDTA·H<sub>2</sub>O 1g, KH<sub>2</sub>PO<sub>4</sub> 0.1g  
 1 ) 500 μl 3  
 2  
 400 μl  
 [Tris(pH 8.0) 10mM, NaCl 400mM, EDTA  
 2mM] 10% SDS  
 27 μl K 10 μl 가 56 2  
 NaCl 135 μl  
 15 . 13000rpm 1  
 2  
 DNA  
 (lymphocyte) DNA 70%  
 , 100 μl .  
 (3) (Polymerase Chain Reaction :  
 PCR) (Restriction frag-  
 ment length polymorphism : RFLP)

5 - HTTLPR  
 PCR  
 sense : 5' - ggc gtt gcc gct ctg aat gcc - 3'  
 antisense : 5' - cag ggg aga tcc tgg gag agg  
 t - 3'  
 PCR 50 μl , Takara 2 x  
 GC , 200 μM dNTP, 0.3U Taq ,  
 20pmol/50 μl, DNA 200ng  
 . PCR DNA cyclor  
 94 5 1 , 94 30 , 54 30 ,  
 72 30 32 , 5 72  
 1 4 PCR  
 PCR 44bp가 , 265bp,  
 44bp가 221bp

COMT val158met  
 PCR  
 sense : 5' - ctc atc acc atc gag atc aa - 3'  
 antisense : 5' - gat gac cct ggt gat agt gg - 3'  
 PCR 30 μl , 10 x Taq

(500 Mm KCl, 100 Mm, Tris - HCl, pH 8.3 and  
 15 mM MgCl<sub>2</sub>), 2.4 μl of 2.5 mM dNTP,  
 1 μl (10pmol/ μl) 0.5 μl Taq  
 (5U/ μl)10pmol/ μl, DNA 200ng  
 . PCR DNA cyclor  
 94 5 predenaturation  
 94 30 , 52 30 , , 72  
 30 33 5  
 72 1 4 PCR  
 PCR DNA 210bp .  
 10 μl PCR 10unit Nla  
 37 2 . A 71bp,  
 67bp, 54bp, 18bp , G 85bp,  
 71bp, 54bp .  
 (4)

PCR  
 , 2% agarose ,  
 ethidium bromide  
 (ultraviolet transilluminator)  
 (polaroid, film 667)

2) 성격 특성 평가

Cloninger<sup>3)</sup>  
 (Temperament and Character Inventory, TCI)  
 ,<sup>18)</sup> TCI  
 240 , “ - ”  
 . TCI 4가  
 3가

3) 통계분석

TCI t -  
 SPSS/PC+version  
 10.0 , 0.05 .

결 과

116 ( 70 , 46 )  
 22.37 ± 1.55 .  
 5 - HTTLPR, COMT Hardy - Wein-

berg (1). 5-HTTLPR HTTLPR L, S 가 ST  
<sup>5)</sup> 12.36 ± 5.16, 14.79 ± 6.61 , COMT  
COMT M, S CO 30.73  
<sup>19)</sup> ± 5.55, 28.29 ± 7.13 .  
5-HTTLPR COMT  
TCI 가 (2, 3). 고 찰  
5-HTTLPR I/I  
가 (n=4), COMT Met/Met Cloninger , ,  
가 (n=7) 5-HTTLPR I/I I/s , ,  
L s/s (S ) , ,  
, COMT Met/Met Met/Val M  
Val/Val (V ) , ,  
. 5-HTTLPR ST (P=0.050) , ,  
, COMT CO (P=0.053) , ,  
. 5- TCI

**Table 1.** Distribution of genotypes in healthy subjects

Genotype		Total		
5-HTTLPR	I/I	I/s	s/s	
	4(3%)	34(29%)	78(68%)	116(100%)
COMT Val158Met	Met/Met	Met/Val	Val/Val	
	7(6%)	38(34%)	68(60%)	113(100%)

**Table 2.** Temperament dimensions in subjects sorted by 5-HTTLPR genotypes

TCI scale	Mean S.D.			ANOVA F, P
	I/I(n=4)	I/s(n=34)	s/s(n=78)	
Novelty seeking	15.25 ± 4.64	17.64 ± 6.03	18.29 ± 5.42	0.660, 0.519
Harm avoidance	18.00 ± 4.54	16.44 ± 7.05	15.37 ± 6.61	0.529, 0.590
Reward dependence	15.75 ± 3.86	14.85 ± 4.00	15.39 ± 3.74	0.276, 0.760
Persistence	4.25 ± 2.36	4.97 ± 1.89	4.79 ± 2.02	0.264, 0.769
Self-directedness	22.50 ± 8.16	26.61 ± 8.15	25.25 ± 6.65	0.803, 0.451
Cooperativeness	27.00 ± 7.43	28.79 ± 7.27	29.55 ± 6.34	0.388, 0.680
Self-transcendence	9.75 ± 4.64	12.67 ± 5.20	14.79 ± 6.61	2.365, 0.099

**Table 3.** Temperament dimensions in subjects sorted by COMT Val158Met genotypes

TCI scale	Mean S.D.			ANOVA F, P
	Met/Met(n=7)	Met/Val(n=38)	Val/Val(n=68)	
Novelty seeking	14.71 ± 5.08	18.89 ± 4.27	17.83 ± 6.07	0.539, 0.585
Harm avoidance	19.28 ± 10.17	14.18 ± 5.77	16.17 ± 6.69	0.466, 0.629
Reward dependence	16.85 ± 5.11	15.42 ± 3.34	15.10 ± 3.86	0.244, 0.784
Persistence	5.42 ± 1.39	4.73 ± 1.68	4.80 ± 2.21	0.192, 0.825
Self-directedness	23.85 ± 10.99	26.10 ± 6.71	25.41 ± 6.93	0.244, 0.784
Cooperativeness	32.71 ± 7.36	30.36 ± 5.19	28.29 ± 7.13	0.192, 0.825
Self-transcendence	16.14 ± 4.14	14.26 ± 6.35	13.50 ± 6.35	0.253, 0.777

가 COMT val/val 가 NS  
가 DRD4 7- 가 가  
5-HTT Lesch<sup>5)</sup>  
5-HTTLPR s/s HA 가  
<sup>8)9)</sup> TCI ST CO D4 NS  
가 5-HTT 5-HT<sub>2C</sub>  
I/I, I/s, s/s 가 RD PS  
, I/I 가 (4) 가 <sup>28)</sup> 5-HT<sub>2C</sub> serine  
CO- D4 가 RD  
MT TCI  
. 5-HTT ST, CO 5-HTTLPR 's' COMT  
가 (val/val met/met ) 가  
가 PS <sup>19)</sup>  
5-HTT Comings<sup>29)</sup>  
ST , COMT 가  
CO <sup>3)</sup>  
Cloninger가  
. ST 5-HT  
Ellermann Reed<sup>21)</sup> ST  
가 , Bulik  
<sup>22)</sup> ST 가 s  
Borg<sup>23)</sup>  
(positron emission tomography)  
5-HT<sub>1A</sub> ST 가  
<sup>24)</sup> 5-HT<sub>2A</sub>, 5-  
HT<sub>6</sub> ST 가  
. 5-HTT  
중심 단어 : 5-HTTLPR · COMT ·  
COMT CO  
CO  
가  
<sup>25)26)</sup> COMT CO 가  
가 가  
50%  
, 5-HTT 7~  
9% 가 <sup>27)</sup>  
가

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