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Research Paper

Theoretical analysis indicates human genome is not a blueprint of life, but a storage of genes and human oocytes have an instruction

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ABSTRACT

Is Human Genome really a blueprint of life? If it is not a blueprint, how are human bodies constructed? Firstly, the present study solves this proposition. We indicate 9 examples of important biological pathways and factors among house-keeping gene products and proved that human genome is not a blueprint of life. Loci of genes in biological pathways of 9 examples are scattered at random in Human Genome in one-dimension. If the Human Genome is the blueprint, 9 important exceptions are not acceptable. That is why Human Genome is not a blueprint of life but a storage of genes. Secondly, we proved that human oocytes have an instruction for development and differentiation. In this case, we used opened public database NCBI for expression profiles of human oocytes. We discovered about 22,000 genes which are all gene expressed in human oocytes. This indicates that human oocytes have the instruction for human body planning. Here we show that human genome is not a blueprint of life but a storage of genes, and human oocytes have the instructions.

Key words: Human genome, blueprint, oocytes.

INTRODUCTION

Human Genome has been thought to be a blueprint of life, but what type of the blueprint has been a mystery. Human Genome project was completed in 2003, and 16 years has already passed, but the exact number of human genes still unknown. Analysis of human genomes has been continuously done, but the discussion which Human Genome is a blueprint of life has not been done. Far from that, any traces of a blueprint are not found in Human Genome. This must be the evidence that Human Genome is not a blueprint of life. The Watson-Click's DNA double helix is very beautiful. Hence, life-scientists might have been imprinted that Human Genome is a blueprint. If we hypothesize that Human Genome is a blueprint of life, what types of defects emerge? And if Human Genome is not a blueprint of life, what must be needed to construct human bodies? To solve these propositions is the aim of this study (Itoh, 2011).

MATERIALS AND METHODS

Table 1 was made from NCBI database OMIM (https://www.ncbi.nlm.nih.gov/omim/) and a Biochemistry Text book (2015). Supplemental Table 1 was made from NCBI gene expression data of genes expressed in human oocytes (https://www.ncbi.nlm.nih.gov/).

RESULTS AND DISCUSSION

Proposition 1. *Human genome is not a blueprint of life but a storage of genes.* We scrutinized loci of genes for 9 important biological pathways and factors, and those loci are scattered all over Human Genome at random (Table 1). We assumed that a blueprint must have the rule such as regularity, periodism, harmony, some types of patterns, or

Table 1 Continuation: Loci of genes for major biological pathway.

1. Glycolysis	
Gene name	**Locus**
Glucokinase (Hexokinase 4)	7p13
Glucose 6-phosphatase	17q21.31
Hexokinase 1	10q22.1
Hexokinase 2	2p12
Hexokinase 3	5q35.2
Phosphoglucose isomerase	19q13.11
Phosphofructokinase, Liver Type	21q22.3
Fuctose-1,6-bisphosphatase	9q22.32
Aldolase A	16p11.2
Aldolase B	9q31.1
Aldolase C	17q11.2
Triose phosphate isomerase	12p13.31
Glyceraldehyde 3-phosphate dehydrogenase	12p13.31
Phosphoglycerate kinase 1	Xq21.1
Phosphoglycerate mutase	10q24.1
Enolase 1	1p36.23
Enolase 2	12p13.31
Enolase 3	17p13.2
Pyruvate kinase, liver and RBC	1q22

2. TCA cycle	
Gene name	**Locus**
Aconitase	22q13.2
Isocitrate dehydrogenase	15q26.1
alpha-ketoglutarate dehydrogenase	7p13
dihydrolipoyl dehydrogenase	7q31.1
dihydrolipoyl succinyltransferase	14q24.3
succinate-CoA Ligase, alpha subunit	2p11.2
Succinate-CoA Ligase, ADP-Forming, beta subunit	13q14.2
Succinate dehydrogenase	5p15.33
Fumarase	1q43
Malate dehydrogenase	7q11.23
Citrate synthase	12q13.3

3. Pentose phosphate pathway	
Gene name	**Locus**
Glucose-6-phosphate dehydrogenase	Xq28
6-phosphogluconolactonase	19p13.11
3-epimerase	2q34
ribose-5-phosphate isomerase	2p11.2
transketolase	3p21.1
transaldolase	11p15.5
Phosphohexose isomerase	19q13.11
aldolase A	16p11.2
aldolase B	9q31.1
aldolase C	17q11.2
triose-phosphate isomerase	12p13.31
fructose 1,6-bisphosphatase	9q22.32
phosphohexose isomerase	19q13.11

Table 1 Continuation: Loci of genes for major biological pathway.

4. Urea cycle	
Gene name	**Locus**
Carbamoyl phoshpate synthase I	2q34
Ornithine transcarbamylase	Xp11.4
Argininosuccinate synthase	9q34.11
Argininosuccinate lyase	7q11.21
Arginase	6q23.2

5. Fatty acid metabolism	
Gene name	**Locus**
long-chain acyl-CoA synthetase	4q35.1
acyl-CoA dehydrogenase	1p31.1
acyl-CoA oxidase	17q25.1
enoyl-CoA hydratase	10q26.3
3-hydroxyacyl-CoA dehydrogenase	4q25
long-chain 3-hydroxyacyl-CoA dehydrogenase	2p23.3
acetyl-CoA acyltransferase	18q21.1

6. Purine biosynthesis	
Gene name	**Locus**
phosphoribosyl pyrophosphate synthetase	Xq22.3
phosphoribosy lpyrophosphate glutamyl amidotransferase	4q12
phosphoribosylglycinamide formyltransferase	21q22.1
phosphoribosylformylglycinamidine synthetase	17p13.1
phosphoribosylaminoimidazole carboxylase	4q12
phosphoribosylaminoimidazole synthase	21q22.11
adenylosuccinate lyase	22q13.1
5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase	2q35
IMP cyclohydrolase	2q35
adenylosuccinate synthetase	1q44
IMP dehydrogenase	7q32.1
GMP synthetase	3q25.31

7. Pyrimidine biosynthesis	
Gene Name	**Locus**
carbamoyl-phosphate synthase	2p23.3
aspartate transcarbamoylase	2p23.3
dihydroorotase	2p23.3
dihydroorotate dehydrogenase	16q22.2
orotate phosphoribosyltransferase	3q21.2
orotidylic decarboxylase	3q21.1
CTP synthase	1p34.2
ribonucletotide reductase, M1 subunit	11p15.4
ribonucletotide reductase, M2 subunit	2p25.1
thymidylate synthetase	18p11.32

8.Beta-oxdation of fatty acids	
Gene name	**Locus**
Acyl-CoA synthetase	4q35.1
Acyl-CoA dehydrogenase	1p31.1

Table 1 Continuation: Loci of genes for major biological pathway.

8.Beta-oxdation of fatty acids	
Gene name	**Locus**
delta2-enonl-CoA hydratase	19q13.2
L(+)-3-hydroxyacyl-CoA dehydrogenase	4q25
thiolase	2p23.3

9.Biosynthethis of long chain fatty acids	
Gene name	**Locus**
Malonyl-CoA Decarboxylase	16q23.3
Acetyl CoA carboxylase	17q12
3 ketoacyl synthase	3p24.2
3 ketoacyl reductase	Xp11.22
Hydratase	10q26.3
Enoyl reductase	19p13.12
Thioesterase	1p36.31

beauty which a blueprint itself has. But there do not exist such things. The loci of genes for 9 pathways and factors are scattered all over Human Genome at random in one-dimension. There are no reports that scattered genes in one-dimensional construct clusters in three-dimension. Is it necessary that Human Genome make clusters in three dimension in nuclei? Proteins which are gene products make complexes and work in cytoplasm. Human Genome does not need to make clusters in three- dimension in nuclei. It is enough to be a storage of genes in one-dimension. If genes make clusters in three dimension, there must exist thousands or more clusters in a nucleus. For example, several enzymes work in deferent biological pathways. It is not logical because Human Genome must easily tangle. In mathematics, sometimes one opposite example is enough for proof. But biology has many exceptions. However, the genes in Table 1 are biologically important, and if Human Genome is a blueprint of life, 9 exceptions must not be acceptable. We assumed that 9 exceptions are enough evidence. We already surveyed more than 30 pathways and we had the same results. Even if we survey more than 100 biological pathways, the result must be the same. Therefore, we theoretically and logically prove that a human genome is not a blueprint of life. Human Genome is just a storage of genes.

Proposition 2. *Human oocytes have the instructions.* Before fertilization, human oocytes express genes. If a Human Genome is storage of genes, mRNAs which are important for development and differentiation must be expressed in human oocytes and translated into proteins before fertilization begins. Therefore, we surveyed the database and found about 22,000 genes are expressed in human oocytes. In general, many sample data must be necessary for comparison of gene expression levels for statistical analysis. But in this case, we do not need to compare gene expression levels. Because the importance is what types of genes are expressed in human oocytes. As a result, all genes are expressed in human oocytes. This indicates that human oocytes have the instruction to build human bodies if human oocytes do not have the simple instruction. By the way, where is the instruction? We already indicate that a human genome is not a blueprint of life. Hence, it is logical that human oocytes have the simple instruction because a human body begins to be built from only one cell, a fertilized egg. In case of *in vitro* Fertilization (IVF), fertilized eggs develop and differentiate from only one cell. Therefore, we logically proved that human oocytes have the simple instruction. Hence, we think that Human Genome begins to exist as just a storage of genes. And human oocytes express essential genes for development and differentiation as the simple instruction. After fertilization, a fertilized egg differentiates according to micro-environment surrounding it. From now on, a lot of evidence will be piled up to support our hypothesis. Finally, we foresee that once organogenesis begins, tissue differentiation proceeds autonomously and human bodies are built. Here, we show that Human Genome is not a blueprint of life but a storage of genes, and Human oocytes have the instruction.

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