



# The Answer to the “First Question” in Genetics: The Hereditary Material

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## Abstract

The basis of genetics should be the hereditary material which should be able to produce the individual. DNA (Genes) is ever regarded as the producer of the individual. However, DNA being lack of producing force can not produce the individual. So, this paper’s task is to look for another element, producing force, which along with genes (DNA) forms the hereditary material. And finally the paper confirms that the egg’s transcriptase system is this producing force.

## Subject Areas

Biochemistry, Genetics, Molecular Biology

## Keywords

Hereditary, Gene, Transcriptase, Genetics

## 1. Introduction

The hereditary material is the answer for the “first question” in genetics and also is cornerstone on which to build genetics.

Mendel’s experiments are typical “second question” experiments in genetics. Therefore, the gene found by Mendel only is a hereditary (template) element controlling the specifications of an individual (traits) rather than the hereditary material [1].

The gene has no ability to produce an individual (traits to be included), so there must be other element(s) to provide production force.

Here, we are going to find out the production force.

## 2. The Transcriptase (System) of Egg Is Another Element of the Hereditary Material

Indeed the production force, another element of the hereditary material, has

been in front of us for a long time. It is inherent in the following facts. 1) Without transcriptase, DNA “information is passive and of no benefit to the cell” [2]; 2) All RNA (including the RNAs required to produce all proteins) in cellular organisms is synthesized by transcriptase through the building of 3',5'-phosphodiester bonds, then these RNAs produce all of the proteins [3]-[8] required for organisms; 3) Without transcription there would be no life. Transcription “takes place continually in living cells and is absolutely essential for life” [2]. It is the transcriptase-system (including transcriptase and a set of transcription factors) that causes DNA (genome) to be transcribed and a cell to proceed through an automatic, programmed course until new cells are produced; and 4) The most important is that any individual, no matter whether animal or plant, is a normal, predetermined and natural automatic result of a certain egg's transcriptase-system performing transcription of DNA (a genome).

The ewe “Dolly” was the product of a Scottish Blackface ewe egg's transcriptase-system transcribing a Finn Dorset ewe's DNA (genome) [9]. The so-called “synthetic cell” is the product of a *Mycoplasma capricolum* cell's transcriptase-system transcribing a “man-made” DNA (genome) [10]. Here, the genome of “Dolly” only stimulates a Scottish Blackface ewe egg's transcriptase-system to produce the ewe “Dolly”, the genome itself produced nothing; the man-made DNA stimulates a *Mycoplasma capricolum* cell's transcriptase-system to produce the so-called “synthetic cell”, the man-made genome itself also produced nothing. Just like Avery *et al.* said: “DNA is capable of stimulating unencapsulated R variants of Pneumococcus Type II to produce a capsular polysaccharide” [11].

Therefore, the egg's transcriptase-system (consisting of transcriptase and a set of transcription factors required for ensuring that the above automatic, programmed course to run) is the production force. The union of the egg's transcriptase-system and the genome (hereafter “Transc × DNA” represents the union) forms the organism's producer, namely the hereditary material.

### 3. The Hereditary Material and Replication

Because the hereditary material is the producer of the individual, the living things' reproduction (*i.e.* the old individual producing the new individual) should first give offspring the hereditary material, and then the new individual can be produced by the hereditary material. The old individual also originally came from the hereditary material; therefore, the self-replication of the hereditary material is the basis of biological reproduction.

So-called “modern genetics” regards DNA (genes) as the hereditary material and claims that DNA is a self-replication substance; however, there is no factual basis to this claim. We only need to ask the question: “In the course of DNA replication, did DNA consume any energy? Do any work? Build 3,5 “-phosphodiester bonds?” “Modern geneticists” are immediately rendered speechless. They cannot deny the fact that all of these tasks were completed by DNA-replicase.

Now, we shall prove that Transc  $\times$  DNA can replicate itself. We chose a clonal cell line as the research material to avoid the (unnecessary) interference of the genome (DNA) separation and recombination during sexual reproduction. In clonal cell lines (including the germ cell lines of multicellular organisms) of any organism (e.g. *Mycoplasma mycoides*), the following fact stands:

1 cell  $\rightarrow$  2 cells  $\rightarrow$  2<sup>2</sup> cells  $\rightarrow$  2<sup>3</sup>...  $\rightarrow$  2<sup>n</sup> cells

Because Transc  $\times$  DNA is present in each cell, the following is also true:

1 (Transc  $\times$  DNA)  $\rightarrow$  2 (Transc  $\times$  DNA)  $\rightarrow$  2<sup>2</sup> (Transc  $\times$  DNA)  $\rightarrow$  2<sup>3</sup>...  $\rightarrow$  2<sup>n</sup> (Transc  $\times$  DNA)

Now we need to determine whether Transc  $\times$  DNA can produce Transc  $\times$  DNA.

1) New DNA is produced by DNA-replicase copying old DNA,

2) Additionally, new Transc are produced by these RNAs, consisting of mRNAs coding for protein members of Transc, rRNAs (to build 3',5'-phosphodiester bonds), tRNAs and a few ribozymes [4]. These RNAs, along with mRNA coding for DNA-replicase, form an RNA group labelled  $\Sigma$ RNA<sup>+</sup>.

3) Again, we know that all the RNAs ( $\Sigma$ RNA<sup>+</sup> included) of a cell are produced by the cell's Transc  $\times$  DNA.

4) Thus, the following can be stated: Transc  $\times$  DNA  $\rightarrow$   $\Sigma$ RNA<sup>+</sup>  $\rightarrow$  Transc  $\times$  DNA, which shows that Transc  $\times$  DNA can produce Transc  $\times$  DNA itself.

So, we know that although DNA is not a self-replicating material and that the transcriptase-system also is not a self-replicate material. However, Transc  $\times$  DNA is a self-replicated material.

Moreover, there is another group of RNAs in the cell, labelled  $\Delta$ RNA<sup>+</sup>, and  $\Delta$ RNA<sup>+</sup> +  $\Sigma$ RNA<sup>+</sup> = all RNA.  $\Delta$ RNA<sup>+</sup> consists of all other mRNAs coding for proteins involved in a cell's construction and other (besides replication) function. Relying on  $\Sigma$ RNA<sup>+</sup> (providing the force for building peptide bonds)  $\Delta$ RNA<sup>+</sup> could also be translated into proteins, which would subsequently result in the formation of new cell. Here we once more prove that the cell is the product of Transc  $\times$  DNA, because it is formed by the material coming from  $\Sigma$ RNA<sup>+</sup> and the material coming from  $\Delta$ RNA<sup>+</sup>.

#### 4. The Hereditary Material and the Individual (Traits)

The hereditary material is the producer of the individual (traits). There is no doubt that the producer creates and determines everything about its product. This exactly is the natural link between the hereditary material and the producer of the organism. The so-called "modern genetics" regards DNA (genes) as the hereditary material and, therefore, believe that DNA (genes) is the only factor producing and determining the organism's trait. Thus, the organism's traits are a function of one variable and the only variable is DNA (genes). Therefore, the so-called "modern genetics" are only concerned with gene-determining traits.

Now we have proved that Transc  $\times$  DNA is the hereditary material. Consequently, the organism's trait should be functions of two variables, Transc and DNA (genes). In fact, many hereditary phenomena in the living world cannot be

explained by genes only, and they should be examples of the traits determined by the Transc. Unfortunately, research in this field is limited, with the most famous study being P. Michaelis' *Epilobium* experiment [12] [13]. Several cases of different offspring being produced from reciprocal crosses cannot be explained by genes. The most famous example is:  $horse^{\ominus} \times donkey^{\delta} = mule$ , while  $donkey^{\ominus} \times horse^{\delta} = hinny$ . Other examples involve two varieties of *Epilobium* that were tested for reciprocal crosses:  $Jena^{\ominus} \times M\u00fcnchen^{\delta} = \text{tall plant}$ , while  $M\u00fcnchen^{\ominus} \times Jena^{\delta} = \text{short plant}$ , and two varieties of *Bufo* that were crossed reciprocally:  $Bufo\ communis^{\ominus} \times Bufo\ viridis^{\delta}$  and  $B. viridis^{\ominus} \times B. communis^{\delta}$ , which produce quite different progeny.

Multicellular individuals (such as dogs) have a variety of somatic cells, which have the same genes (genomes) but have different traits. This is another problem that "modern genetics" cannot explain. In the so-called "modern genetics", traits are a function of the only variable, the gene. However, when the gene is the same, how respective kinds of the somatic cell have different traits?

Some people may state that somatic cells can not grow into individuals. Of course, somatic cells cannot grow into dogs, cats or sheep. However, somatic cells can grow into a mass of cells, a piece of tissue, a local part of germinal layer... They can also survive under *in vitro* culture conditions.

The somatic cell still is a normal, predetermined and natural automatic result of its transcriptase-system transcribing its DNA. Therefore, the somatic cell is the product of its Transc  $\times$  DNA, and, of course, is a function of its Transc  $\times$  DNA. Because the somatic cell's genome is the same, there is only one variable left, namely Transc. Different kinds of somatic cells have different morphologies, structures and functions because they have different Transc. This is the important piece of evidence that proves the failure of so-called "modern genetics".

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