

## HUMAN GENETICS IN THE HOLY QUR'AN AND SUNNA

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Islam is fundamentally rooted in the Holy Qur'an, which has been in existence for more than 14 centuries, and the Sunna, a collection of sayings and practices of Prophet Muhammad. In recent times, Islamic scientists have once more turned to these primary sources in a quest for an alternative view of certain scientific principles and to look for new ideas from this fountain of knowledge. This paper traces various fundamental principles of human genetics within the Holy Qur'an and Sunna and compares these with the source of the same knowledge in Western science.

### SEX DETERMINATION AT FERTILISATION

When Spallanzani discovered the process of fertilisation in 1775 by studying frogs, he did not know at what point the sex in the frog embryo was determined in this process.<sup>1</sup> X and Y chromosomes were discovered in the beetle by N.M. Stevens in 1905 but he doubted that these chromosomes were sex determinants in the zygote, and thought that they were simply part of the genetic make-up and were associated with secondary sexual characteristics.<sup>2</sup> In 1919, Morgan and Bridges, while studying the *Drosophila* fly, found that the X and Y chromosomes play an important role in sex determination.<sup>3</sup> However, the knowledge of sex determination in mammals had to wait until 1959 for Jacobs *et al.* studying humans, and for Welshons and Russell in their study of the mouse in the same year, to show that mammals resemble the plant *Melandrium* in that the Y chromosome is male-determining. This paved the way for the concept that spermatozoa determine the eventual sex of the baby by containing either the X or the Y chromosome.<sup>4</sup>

The Holy Qur'an describes fertilisation in some detail and has done this in nine stages;<sup>5</sup> it has gone even further to show at what point in human embryology sex is determined.

Allah says that 'He did create the pairs, male and female. From a sperm drop when lodged'.<sup>6</sup> This verse clearly states that the sex of the offspring is determined soon after a sperm drop is lodged. This is repeated for emphasis in another verse, which states: 'and He out of semen made both sexes, male and female'.<sup>7</sup>

### PROPERTIES OF CHROMOSOMES

The carriage of characteristics from the parents to the offspring is also described in several places in the Holy Qur'an. Allah says:

From [part of] a sperm drop He hath created him, and then immediately programmed him [his future].<sup>8</sup>

And Allah did create you from dust; then from [part of] a sperm drop; then made you pairs [after the stage of the sperm drop]. And no female conceives, or lays down [her load] but with His knowledge.<sup>9</sup>

These two verses refer indirectly to two very important properties of nuclear chromosomes: the first refers to semen carrying the characteristics of the individual and the second suggests the pairing of genetic characteristics.

In a tradition related to the Prophet:

Um Sulaim came to Allah's messenger [peace be upon him] and said, 'Is it necessary for a woman to take a bath after she has a wet dream [nocturnal discharge]?' The Prophet replied, 'Yes, if she notices a discharge'. Um Salamah then covered her face [shyly] and asked, 'O Allah's messenger! Does a woman get a discharge [fertile fluid]?' He replied, 'Yes and that is why the child also resembles the mother'.<sup>10</sup>

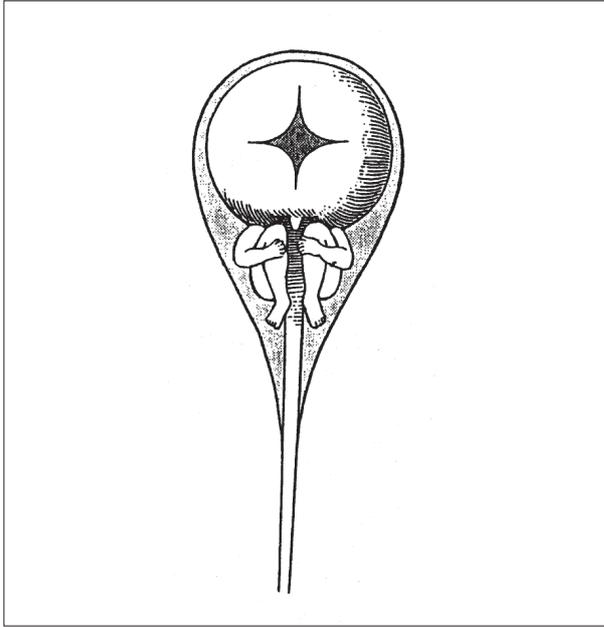
This passage shows that a woman participates equally in the process of fertilisation and that her characteristics and traits are also passed on to the child through 'substances' (which are now identified as chromosomes) that are contained in her 'fertile fluid', a fact that was not so obvious to Hamm and Leeuwenhoek who, after seeing spermatozoa for the first time, misinterpreted their role and thought that spermatozoa contained small fully formed babies (see Figure 1).<sup>1</sup>

### EXISTENCE OF RECESSIVE GENES

Abu-Huraira narrated:

A man came to Prophet Muhammad [peace be upon him], and said: 'O Allah's prophet, a black child has been born for me!' The Prophet asked him, 'Do you have camels?' The man replied, 'Yes'. The prophet asked him, 'What colour are they?' The man replied, 'Red'. The Prophet said, 'Is there a grey one among them?' The man replied, 'Yes'. The Prophet said, 'Whence comes that?' He said, 'maybe it [the colour] was pulled out by a hidden trait'. The Prophet said, 'maybe your son's [colour] was pulled out [by a trait]'.<sup>11</sup>

The Holy Qur'an exhibits here both wisdom and the



**FIGURE 1**

**A line drawing depicting spermatozoa containing a small fully formed baby.**

highest degree of justice. More than ten centuries before Gregor Mendel was born, history took shape in a monastery garden! No adverse judgement was passed and no sanction applied on this man's wife, and the colour of her offspring was explained as some concealed trait from the family background. The existence of a dominance of certain heritable traits needs no explanation, as it is obvious that a red camel would bear a red offspring.

#### GENE PENETRANCE

In a tradition narrated by Anas, Prophet Muhammad said, 'And if a man's discharge preceded that of the woman, then the child resembles the father, and if the woman's discharge preceded that of the man, then the child resembles the mother.'<sup>13</sup>

The implication behind this is that if spermatozoa are lodged long before ovulation then the activation of the male genes will be at a more advanced stage than those in the ovum, and therefore they will play a greater role in showing the characteristics gained from the father – especially if these genes follow codominance (with variable

penetrance) or have complex inheritance characteristics. It may be of some importance to recall that when the Holy Qur'an was written, women's rights were non-existent and many a female baby was buried alive to avoid the shame of a family bearing a female child, her mother ostracised for bringing shame to the family. The above two verses state clearly that if there is anybody responsible for the sex of the baby it is the father.

This statement also has an important bearing on the dispensing of justice: a woman bearing a dark-complexioned child when both she and her husband are of a lighter complexion is certainly and naturally possible. This applies to those communities in which individuals vary in their skin colouring. This also prevents the use of hearsay evidence to convict and condemn an innocent woman for adultery on the basis that a child is not to the satisfaction of the father.

One of the greatest trusts given to a man is when somebody's daughter or sister is given to him to hold her as his lawfully wedded wife. Therefore, he should not burden his wife with false accusations and abuse.

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