

# Review, Response, Rejoinder

<sup>12</sup>Jack W. Szostak, "Functional Information: Molecular Messages," *Nature* 423, no. 6941 (2003): 689.

<sup>13</sup>Paul Vitányi, "Meaningful Information," in *International Symposium on Algorithms and Computation: 13th International Symposium, ISAAC 2002 Vancouver, BC, Canada, November 21–23, 2002: Proceedings* (Berlin, Germany: Springer, 2002), 588–99.

<sup>14</sup>See Thomas M. Cover and Joy A. Thomas, *Elements of Information Theory*, 2nd ed. (Hoboken, NJ: Wiley-Interscience, 2006) or Ming Li and Paul Vitányi, *An Introduction to Kolmogorov Complexity and Its Applications* (New York: Springer Science + Business Media, 2008).

## Rejoinder

by Randy Isaac

I appreciate Robert Marks's kind remarks and his taking the time to clarify his perspectives. I would like to underscore several points.

1. Any input from an intelligent source required by a mathematical model or an algorithm such as Chaitin's is due to the fact that these models and algorithms are human simulations of a natural process. It cannot be inferred that the natural process itself requires an intelligent source of information. Whatever merit the law of conservation of information—which asserts that new information can be generated only by an intelligent agent—may have in computer models, it does not apply to information in general and is not relevant to DNA information.
2. A key assumption of the information argument for intelligent design is that functional meaning of information such as DNA is identical in every way to abstract meaning of information. Hence it is claimed that since abstract meaning can be generated only by an intelligent source, it is also true for functional meaning. However, the reason that abstract meaning requires an intelligent source is the abstract nature of the meaning and not the characteristic of information itself. Functional meaning does not necessarily have an abstract component.<sup>1</sup> Biochemical processes transform DNA information into functional biological activity without a single step of abstract relationships. Evolutionary processes associate useful biological activity with specific DNA information without the need for an a priori abstract blueprint.
3. The way in which Marks considers probabilities implies that complex biomolecules are assembled anew by starting from a random collection of com-

ponents. No such process is proposed in biological evolutionary theory. Rather, each reproductive event starts with a proven successful set of DNA information. Descent with modification has a high probability of succeeding in generating a new living organism. Biological evolution works.

4. Biology abounds with examples of DNA altered through descent with modification which changes the DNA information set and generates new biochemical functions.<sup>2</sup> Such creation of new information is theoretically possible without an intelligent source, and it is experimentally observed.
5. The assumption of teleology is the primary reason why some mathematical models of evolution lead to impossibly low probabilities. The existence and nature of teleology in evolution is an open question of great interest.<sup>3</sup> I look forward to studying it further. ❧

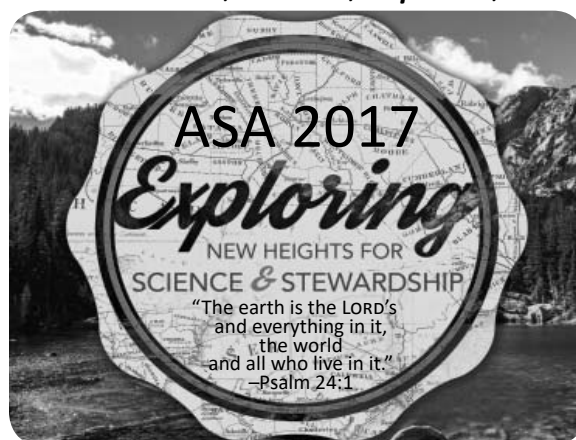
## Notes

<sup>1</sup>Randy Isaac, "Information, Intelligence, and the Origins of Life," *Perspectives on Science and Christian Faith* 63, no. 4 (2011): 219–30.

<sup>2</sup>Dennis Venema, *Letters to the Duchess: ID and Information* (blog series), <http://biologos.org/blogs/dennis-venema-letters-to-the-duchess/series/id-and-information>.

<sup>3</sup>Sy Garte, "Teleology and the Origin of Evolution," *Perspectives on Science and Christian Faith* 69, no. 1 (2017): 42–50.

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