Why clarification of ethical and legal challenges associated with emerging technologies is a hard problem

A novel technological development does not imply novel ethical and legal challenges. A new drug, for example, might involve a novel chemical agent yet be a conventional type from an ethical and legal standpoint. Novelty is defined in relation to a context and with respect to precedent. With respect to "emerging technologies," the very designation implies novelty in relation to the design, development, use, or effect of the technology. But this does not necessarily imply a novelty in relation to the relevant ethical and legal contexts for managing that technology. It is for this reason that we regularly find those working on ELSI asking "what's new?" with an emerging technology. Even when we specify the ELSI context, the question about novelty is still ambiguous. It might involve a challenge to the implicit claim that something is "emerging", as when some claim nanochemistry is just supermolecular chemistry with a sexy designation for funding. More often, however, "what's new?" is meant to probe novelty in relation to an existing infrastructure, and thus ask whether some modification or extension of the infrastructure is needed to properly govern the emerging technology. By considering some examples associated with nanotechnology and synthetic biology, I consider why answering the question about ethical/level novelty is a difficult question. An answer specifying the relevant novelty involves four components: (1) identification of roughly similar conventional science and technology used as a basis for comparison; (2) identification of the relevant ethical and legal norms associated with responsible development of that conventional science and technology; this might involve terms for specification of a hazard, models used for determining toxicity, protocols used for a measurement, and so on ; (3) identification of specific features of the emerging science and technology that deviate from the conventional science and technology identified in (1); and (4) clarification of how the identified difference in (3) calls for a modification or extension of the norms identified in (2). Most significantly, items 1-4 must be aligned in a way that properly captures the nexus of all of these components relevant for governance of the technology. For each of the four items, there are a potentially infinite number of properties that can be isolated at a host of different scales of analysis. Proper clarification of the ethical and legal issues requires honing in on just those properties of the emerging science, conventional science, and norms that enable proper appreciation for how norms need to be extended to preserve an infrastructure of responsible development. This infrastructure, in turn, is central to preserving the stability of the ongoing development of the science and technology. Appreciation of the scope of the task makes clear why work on ethical and legal issues integral to emerging technologies cannot be addressed by specialists working in isolation, and why clarification of the ethical and legal issues raised by an emerging technology is often at least as hard as the research associated with its development.