

instrumental in opening up important discussions among actors such as researchers, developers, designers, students, or policymakers. Indeed, the author's clear and down to earth writing style makes this book very engaging for anyone interested in how algorithms and data practices embed forms of social injustice and how these can be considered when imagining better futures.

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Stefano Crabu

Dalla molecola al paziente. La biomedicina nella società contemporanea [From the Molecule to the Patient. Biomedicine in Contemporary Society], Bologna, Il Mulino, 2017, pp. 179

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"From bench to bedside" is the motto of the emerging translational research in current biomedicine. In the biomedical literature, translational research is promoted as a strategic and efficient way to implement the novel discoveries of biological science in clinical practices, and to incorporate clinical observations back to laboratory science. In Science and Technology Studies (STS) and in social studies of biomedicine, translational research is addressed as a space of problematization instead, which invests important transformations in the articulation of clinical and experimental practices as well as discourses and epistemologies, the generation of novel biological entities and, finally, the making of subjectivities.

In *Dalla molecola al paziente*, Stefano Crabu introduces the Italian reader to the STS discussion on what is often called *precision* or *personalized* medicine. While in the biomedical literature “precision” and “personalized” neutrally refer to the application of genomic knowledge for the development of targeted, patient-specific therapies, in STS these terms are instead problematized. Crabu contributes to this effort of problematization, through an original ethnographical analysis in two strategic sites of translational medicine: an institute specialized in clinical research on cancer and a laboratory working in the emerging field of nanomedicine. Crabu shows how these sites are problematic spaces where the institutional boundaries of care and knowledge production are blurred. He thus explores the complex epistemological and pragmatic realignments of clinical and research practices that characterize translational medicine.

In the first chapter, Crabu sets the analytical framework by discussing the main theoretical approaches in the sociology of medicine, health, and illness and in the social studies of contemporary biomedicine. Here Crabu combines the STS understanding of laboratory practices with some central notions in the social studies of biomedicine, and in particular with the theory of *biomedicalization* developed by Adele Clarke and colleagues (2010). This move allows to grasp the complex transformations occurring in contemporary biomedicine, including what Clarke and colleagues called the “technoscientization” of biomedical knowledge production and clinical practice. Technoscientization is what enables the insertion of STS analysis of laboratory practices into the social studies of biomedicine, through another important analytical notion largely used in this literature, namely the concept of *biomedical platforms* developed by Keating and Cambrosio (2003). Covering semantically “natural and artificial entities, material artifacts and their blueprints, technical and political, material and symbolic referents”, biomedical platforms are “way[s] of arranging things in both a material and a discursive sense... the basis for the organization of activities” (Keating and Cambrosio 2003, 345-6). The concept of biomedical platforms has been introduced to account for the growing importance of biology in current medicine and the clinics, as biology has become “the ultimate description and account of disease origins and mechanisms” (Keating and Cambrosio 2003, 354). It is therefore particularly apt to understand the institutional, pragmatic, and epistemological transformations characterizing the current biomedicine, especially in fields like translational research. In fact, the analytical framework developed by Crabu in this research is strongly indebted with the notion of biomedical platforms and in general to the work of Keating and Cambrosio on the intersection of the new genetics with cancer research and clinical treatment.

A third relevant concept largely adopted by Crabu, is that of *molecularization* (Rose 2007), namely the re-inscription of the biological into the mechanisms and dynamics of the molecular entities of the human ge-

nome. Molecularization, moreover, accounts also for the pervasive use of information technologies in contemporary biomedicine, as well as for the articulation of the molecular in informational terms, that enables the deployment of genomics and post-genomics knowledge in addressing health, illness, and therapies targeted on the patient's genetic specificities. Molecularization, finally, has important implications in the re-making of bodies as *biomedical objects* and of patients as *experimental subjects*. Referring to *biomedicalization*, *biomedical platforms*, and *molecularization*, Crabu investigates what translational medicine implies in terms of the emerging novel articulations and intersections of clinical and experimental practices. The theoretical reflection on these articulations is empirically grounded on the analysis of the practices situated in specific sites of treatment and research, where biomedicine is in the making.

The second chapter is thus devoted to an ethnographical analysis in an Italian medical institute specialized in cancer care and research. Here, by studying what he calls a "translational biomedical platform" (p. 74) in the making, Crabu explores the interconnection of care, clinical research, and experimental development. This valuable analysis is articulated along two interconnected axes. The first axis concerns the re-arrangement of care and clinical research practices in a translational framework. This means that the traditional routines in patients' treatments are reshaped according to the protocols for the research on molecular biomarkers. The second axis refers to the transformations investing patients and their bodies. By combining the reflection on molecularization and on *clinical labor* (Waldby and Cooper 2014), Crabu shows how patients' bodies are re-constituted into a flow of mobile biological samples, parameters, and bio-information, that can be treated *in vitro*, *in vivo*, and *in silico*. The body is fragmented and rewritten through a complex technoscientific apparatus of molecular quantification. In this way, the individual patient is converted into an experimental subject enrolled in the process of bio-knowledge production.

The adjustments of laboratory knowledge to clinical activities and the related re-arrangements of the everyday procedures of care and patients monitoring, according to the requirements of scientific research, are encapsulated in the original notion of *technomimicry*. This notion is the main theoretical contribution of Crabu to social studies of biomedicine. Crabu distinguishes between *clinical technomimicry* and *experimental technomimicry*. The first one captures the "cognitive, material, and technological resources" operationalized in the situated everyday practices that make "scientific research epistemologically consistent with clinical action" (p. 69). The second refers to the ways "the clinic locally re-adjusts its routines and practices" to the norms and methodologies of the scientific laboratory (p. 74). According to Crabu, *technomimicry* is what makes the biomedical platform of translational medicine working, by providing the medical experts with the operative logic for producing clin-

ical data and samples that can be used in the laboratory setting. *Technomimicry*, in its clinical and experimental acceptance, is the analytical device that enables to grasp how translational biomedical platforms are concretely and locally enacted and how the practices of care interpenetrate technoscientific research and innovation.

In the third chapter, Crabu explores the field of nanomedicine, that is the combination of nanotechnologies with the biotechnological design of new entities aimed at improving drug delivery and developing novel molecules to treat cancer. Here, the analytical framework is enriched with the contribution of the so-called *sociology of technoscientific expectations* (Brown and Michael 2003). Largely used in the analysis of emerging and future-oriented technoscientific innovations, this approach is suitable for investigating how discursive spaces of future promises and technoscientific imaginaries are enacted to shape and orient the course of action of research and innovation. The sociology of technoscientific expectations allows Crabu to deploy the notions of biomedical platforms and *technomimicry* for an analysis of future-oriented biomedical technologies. In this way, Crabu investigates the articulation of practices, discourses, and biological and technological objects in the everyday activities of a laboratory working on prospective biotechnological applications.

In the final chapter Crabu goes back to STS and social studies of biomedicine to theoretically discuss the implications of translational biomedical platforms. The ethnographical analysis undertaken in the previous chapters enables the identification of four trajectories that are reshaping the contemporary biomedical landscape: 1) the making of a hybrid space of increasing interaction between the laboratory and the clinical setting and the related technological and organizational arrangements enabling the coordination among different disciplinary fields; 2) the manipulation of the biological and the life itself; 3) the redefinition of the role of the patient as a central actor in nowadays biomedical practices; 4) the transformation of the roles, expertise, and identities of medical, research, and health professionals involved in contemporary biomedicine. The implications of these four trajectories are discussed along two axes.

The first one, centered on Crabu's notion of *technomimicry*, focuses on the articulation and the assemblage of knowledge, practices, and technological objects. Translational medicine is thus not represented as merely a strategy for improving the application of genomic and post-genomic knowledge and techniques to the clinic, as in the biomedical literature. Rather, translational medicine is studied as a new style of practice where the boundaries between the clinical and the experimental are blurred and reconfigured. *Technomimicry*, in both its clinical and experimental acceptance, is the core notion that enables the identification of this novel, emergent style of practice, where clinical routines are shaped to produce scientific data (through the lenses of molecularization), and laboratory procedures are adapted for the generation of knowledge and technologies

usable in the clinic.

The second axis is related to the implications of molecularization for the role of patients. Here lies a huge contrast between how the patient-centered approach of translational medicine is depicted in the dominant narrative of the biomedical literature and how the patient is subjectified in current, concrete biomedical practices. By drawing on the notions of molecularization, clinical labor, and experimental subjectification (Rose 2007; Waldby and Cooper 2014), Crabu shows how the claims of a personalized, patient-centered medicine are instead translated into the reduction of the patient to her/his biological and genetic specificities, materially represented by the bio-information extracted from her/his samples and her/his informatized medical records. Crabu stresses how the patient is, in other words, transformed into a flow of samples and bioinformation, metabolites and biomarkers, bits and data analyzed and manipulated by complex technoscientific apparatuses of calculation and intervention. The translational biomedical platform transforms the living body into elements that are manipulated, mobilized and translated into information according to experimental, patient-oriented practices. In this way, a striking paradox in the dominant rhetoric of translational medicine is addressed: through molecularization, the patient-centered approach turns into the re-inscription of bodies in terms of biological entities and bioinformation. Patients are only represented in discourses, experimental practices, and clinical procedures but not as actors-in-the-flesh. The literature in social studies of biomedicine has largely worked on the implications of molecularization for the re-shaping of the self, individuality, personhood and the subjectification of those who are enrolled as experimental subjects in contemporary biomedicine. A stronger engagement with this literature, and a closer analysis of how patients are experiencing their re-inscription as “separable, mobile, exchangeable and reincorporable body parts” (Rabinow 1999, 95) would have enriched the valuable problematization of translational medicine made by Stefano Crabu. Similarly, the notion of *technomimicry* is useful to capture the mutual and continuous realignment of clinical and laboratory practices in translational medicine, but a discussion about the existing lines of conflict between purely clinical settings and novel translational practices would have further improved the problematization of this emerging biomedical platform.

This book is indeed a precious contribution, well integrated in the existing literature in STS and social studies of biomedicine, and it introduces the Italian readers to the scholarly problematization of the situated discursive, symbolic, and material practices characterizing the contemporary emergent biomedical fields.

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Silvia Gherardi

How to Conduct a Practice-based Study: Problems and Methods. 2nd Edition, Cheltenham, Edward Elgar, 2019, pp. 295

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As a renowned scholar within organization studies, Silvia Gherardi needs little introduction. Spanning topics such as work, organizational learning, sociomaterial practices, and more recently, affectivity, Gherardi’s work is generally known for its ability to introduce and reinforce insightful new perspectives in a timely manner. Most prominently, Gherardi’s work has been influential in establishing practice-based thinking around the same time that the notion of a ‘turn to practice’ gained traction. It is thus fitting that the latest edition of her book *How to conduct a practice-based study* manages to reflect much of the range of her and her colleagues research with specific attention to practice.

In so far as the book covers research, it more importantly covers the process of doing research. The book is not a standard book on methods but one that engages with giving some idea of how phenomena can be conceptualized in a practice-based manner and in presenting stories of how practice-based studies are possible. Consequently, the book is not a summary of research findings or a step-by-step guide on how research is done. While possibly confusing at first for those who might want an easy read on what they should be doing in research, the narrative approach