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Group Organization and Communities of Practice in Translational Research: A Case Study of a Research Team

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Abstract

The collective lived experience of translational research teams requires further appreciation, particularly at the stages of group formation. To achieve this, we conducted a case study of a translational research team (*n* = 16). Through the case description and then discussing case-based themes with community of practice theory, themes such as "Being Open" and "Working as a Group" found that this team's mutual respect, cooperation, and their sharing of knowledge uncovered an alternative way that professionals organize themselves for translational research projects. In conjunction to this finding, our analysis showed that the team has qualities of a community of practice.

Introduction

For over a decade, professionals in the scientific community have questioned why the large accumulation of basic scientific research has been slow to "translate" into clinical applications (e.g., Chubb, 2012; Contopoulos-Ioannidis, Ntzani, & Ioannidis, 2003). Translational Research, through its multidisciplinary, collaborative approach, has emerged as a way to speed up this process ultimately improving patient care. As a result, some governments with advanced economies have responded by implementing what could be described as a translational research paradigm, a means of organizing people and resources to achieve such an outcome.[1] For example, after much planning and negotiations, a pan-European consortium of 70 academic research centers of excellence have been created for translational research projects with their headquarters opened in 2013, Amsterdam (EATRIS, 2014). In 2011, the United States expanded their 2006 translational research initiatives and opened the National Center for Advancing Translational Sciences (National Institutes of Health, 2014).

Collaboration is fundamental to the success of translational research, yet many professionals acknowledge there are difficulties. For "collaborating with those outside the walls of an institution may be more than culturally frowned upon, it may even be illegal [e.g., patented processes]" and "even *within* an institution . . . the subunits of the institution: its departments, its divisions, its components produce collaboration 'walls' of varying substantiality" (Bingham, 2011,

pp. xi-xii). In effect, even though translational researchers realize collaboration is essential, there are problems in achieving this goal. We propose that this might be better addressed by investigating the group work that occurs in the field, as collaboration is essentially about people working jointly on a project.

Literature Review

There is a growing literature about translational researchers, although group work requires more investigation. Studies draw attention to how translational research incorporates an array of professionals working together and across the normative or epistemic cultures of science and medicine (Lander & Atkinson-Grosjean, 2011; Wainwright, Williams, Michael, Farsides, & Cribb, 2006).[2] For example, the sociological research carried out by Wainwright et al. (2006) drew on the experiences of basic scientists working on human stem cell research for diabetes in a UK research facility. They described how these basic scientists maintained a wider discourse of

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the unlikelihood of collaboration between basic scientists and those professionally trained in the medical sphere. However, there were also discursive tactics being employed within the institution and by the professionals themselves to encourage collaboration for translational research.

In a recent study, Porter (2013) conducted research with neuroscientists in a new UK translational research facility that aimed to foster a culture of collaboration. Porter found that collaboration was a means of increasing publication outputs as well as quickening the pace of the translational research process. Yet, selecting people to collaborate with was at times problematic given various inconsistencies in behavior, such as a researcher wanting a colleague's research results, but then not reciprocating. Porter also focused on how the physical space and management's best intentions of facilitating collaboration may not have the desired effect on the professional staff.

Researchers have also noted and discussed the important roles that clinician-scientists (or physician-scientists) have to play in translational research (Lander & Atkinson-Grosjean, 2011; Wilson-Kovas & Hauskeller, 2012). Wilson-Kovas and Hauskeller's (2012) research was one of the first to focus on clinician-scientists and the role they play in the translational research process, bringing the knowledge of both basic science and medicine, which is perceived to better facilitate the process.

An interesting study by Lander and Atkinson-Grosjean (2011) from an innovation system perspective theorized and documented the hidden noncommercial organizational arrangements between hospital and university institutions, which facilitated a successful translational research process. The research traced the development of a clinical application from when a sick child was presented to a pediatric clinician-scientist, and how professionals in both the hospital and university laboratories worked together to create a diagnostic test.

Morgan and colleagues (2011) conducted a pilot study instigated by the United Kingdom's Medical Research Council, where a Research Translator was employed to stimulate a translational research culture between professionals at a teaching and research hospital. Much of the study centered on how basic scientists and clinician-scientists responded to the translational research change agent. The study also provided details about the understandings of translational research by particular actors, namely, the Research Translator, basic scientists, and clinician-scientists, along with details about how a panel assessed the translatability of research.

Social research has made inroads into understanding translational research. However, few studies investigate the interactions between professionals working in translational research groups, particularly at the stage of their development. For the most part, there is a technocratic mood to current research, where there is a limited sustained description on the collective lived experience of being in translational research teams.

Research Aim and Question

A novel way of investigating the collective lived experience of translational research teams is to return to thinking about the importance of collaboration as tied to learning in practice. Collaboration, particularly when professionals identify as coming from different professional cultures and/or disciplines, means that professionals need to learn in practice from one another to achieve their common goals (cf. Oborn & Dawson, 2011, on multidisciplinary health teams learning to work together). This type of learning is not entirely an apprenticeship of sorts (see Lave & Wenger, 1991) but a mode of learning that happens within some type of "organizational imagination"— whether participants are fully cognizant of this or not (Wenger, 1998, p. 257). Given that translational research is only possible in highly sophisticated and globally connected organizational spheres, the type of learning being discussed here is the Wengerian conception of "communities of practice." This is a social theory of learning that is grounded in organizational life, even though it may stretch beyond the immediate organizational environment.

It has been found that in translational research work, "the scientific and the clinical are embodied in different communities of practice with distinct cultures and practices" (Cribb, Wainwright, Williams, Farsides, & Michael, 2008, p. 354), which suggests that collaboration is a challenging process between professionals located on different sides of this divide. Yet, usage of the term *communities of practice* in Cribb et al. (2008) is more akin to viewing different professional identities in translational research as belonging to respective communities of practice. A similar idea can also be found in Oborn and Dawson's (2011) work albeit about professional identities in health care. We are now asking whether a self-identified translational research team (composed of people from both the scientific and medical spheres) constitutes a community of practice within an organization that intended to foster translational research. Our research directive is enveloped within the overarching aim of describing the collective lived experience of being in a translational research team in a specific organizational context.

We believe that such an approach is warranted as much opinion and policy, along with social and organizational theory deployed on translational researchers, is designed to enhance organizational performance in terms of outputs, which treats the humans who work in this field as a mere (albeit important) resource. We borrow the critical management studies seminal concept of "(non) performative intent" as a means of countering "the intent to develop and celebrate knowledge which contributes to the production of maximum output for minimum input; it involves inscribing knowledge with a means-ends calculation" (Fournier & Grey, 2000, p. 17). For this research, there is interest in describing the collaboration between the professionals and presenting their voices—particularly at the group development stage—to simply discover what can be found there.

Table 1. Summary of the Case-Based Themes With Their Respective Subthemes.

Case-based themes	Subthemes
Coming together	• Broader strategies • Common interests • Being open
Learning from others	• Learning in practice • Time constraints
Shared competencies	• Knowledge of science • Working as a group • Equality

Table 2. List of Data Sets Collected.

Data corpus

1. Author's notes from unobtrusive observations in Team meetings (×4)
2. Transcriptions of the research Team's discussions during meetings (×4)
3. Documents collected from Team meetings (×4)
4. Author's notes from interactive participant observations between May and August, 2009
5. Documents (paper based and electronic) provided by individual participants
6. Transcriptions of the author's audiotaped reflective journal during the participant observations
7. The Research Team's funding proposal and other related documents
8. Agendas and minutes for all meetings between February and July 2009
9. Documents (paper based and electronic) collected in organizational surrounds or sent by individual participants
10. Transcriptions of focus groups

Design

Theoretical Perspective and Method

An interpretive perspective was used in this research, as there was a focus on describing the collective lived experiences of the members of the team in their organizational context. This was realized by way of an intrinsic case study because "we are interested in it [the case], not because by studying it we learn about other cases or about some general problem, but because we need to learn about a particular case" (Stake, 1995, p. 3).

First, we describe and contextualize the team members and case study sample, within their organizational setting, that is, the biomedical research team working in an Australian medical research institute. Such context is articulated through a *Case Description* that is intended to state the "facts" in a narrative-like manner (Creswell, 2007). Against this background, the *Case-Based Themes* (Creswell, 2007) are then presented with a discussion on whether the group could be considered a community of practice. Table 1 provides a summary of the case-based themes with their respective subthemes. The article ends with a final conclusion and suggestions for further research.

Case Sample Selection

The main reason this research team was selected is that they had only recently formed a group, so there was an opportunity to research how they organized themselves. Another reason in selecting this particular case was that translational research was not yet a governmental priority in Australia at the time. In 2009, the federal government issued *Powering Ideas: An Innovation Agenda for the 21st Century*. It outlines the 10-year reform agenda for Australia's knowledge-based industries to address "the country's long-term weakness in business innovation, and in collaboration between research and industry" (Commonwealth of Australia, 2009, p. 4). There is no specific mention about translational research, although collaboration is emphasized. In 2011, as this project concluded, the government established the Therapeutic Innovation Australia organization, designed in part to better

coordinate translational infrastructure and provide support to translational researchers by integrating the academic, industry, and public spheres (McKinnon, 2011).[3] Our case then provided us with an opportunity to view the emergence of a translational research team within an organization without the comparable government support found in other advanced economies.

Method

Following university and hospital ethics approval, 16 researchers of an initially 22-member translational research team (referred to in this article as The Team), agreed to share their experiences of working together on a translational research project.

Multiple methods of data collection were deployed by the primary researcher (first author), including participant observation between May and August 2009; document collection, which related to The Team, such as their successful funding application; and general documents broadly circulated within the organization such a newsletters and emails. Near the end of the participant observation phase, two focus groups were also conducted with many questions themed by the idea of collaboration. The first lasted an hour with six participants and the second ran for 45 min with five participants. A list of data sets collected from the methods is provided in Table 2.

Data Analysis, Co-Researchers, and Participant Checks

All data collected were instrumental in developing the case description through categorical aggregation and direct

interpretation (Stake, 1995). The transcripts from the focus groups were considered to be a significant data set of the corpus, as there was much discussion on the group work of The Team. The transcripts from the focus groups were therefore subjected to further analysis that sought to identify salient case-based themes through the process of template analysis (King, 2006). Confidentiality of participants was ensured with interviewee talk de-identified from each participant in the transcripts. The process of template analysis was conducted by the primary researcher and a co-researcher (second author), who was also a participant in the study. She was able to draw on her considerable practitioner knowledge as a medical scientist (see Benington & Hartley, 2006, on co-research methodology in organizations). This was balanced with wider input through a validation meeting held in February 2010, where five members of The Team came together to assess whether the case-based themes generated during data analysis reflected what The Team had intended to convey (see Shenton, 2004, on member checks for research credibility). Then, a full write-up of the research by the primary researcher (first author), using pseudonyms for each participant to ensure their anonymity, was read by a clinician-scientist (third author) as another participant check. He too was a participant in the study and another co-researcher. Given his extensive experience in clinical medicine, along with medical, basic science, and translational research, he was asked to provide feedback on whether the primary researcher (first author) was able to effectively describe the lived experience of being in The Team within this specific organizational context.

Case Description

Organizational Milieu

The Team was located within a biomedical research institute in Australia that, among other things, investigates the causes and prevention of health conditions for humans, including diseases such as cancer, arthritis, and stroke. As the institute's promotional material explained, the organization is the "productive research arm" of a public teaching hospital and aims to create a "dynamic environment in which research and research training opportunities are pursued."

In 2009, the research institute relocated its staff to a new purposely built building and rebranded itself as a translational research facility, as this expression was believed to capture the core work. Many researchers were aware of the developments of translational research across the world and sought to implement it within their projects and various departments. However, not all researchers were convinced that translational research was anything new, believing that they and others in the scientific community had been carrying out such collaborative work for years.[4]

Key Facts About the Research Team

It was within this organizational milieu that The Team started work on their projects with funding for 3 years. However, the catalyst for their interactions came in 2008 when a benevolent foundation, with a strong history of supporting the research institute, offered to fund projects that were designed to encourage professionals from different research specialties and conventional research groupings to collaborate within the new facility. The Team was formed with professionals from four established public teaching hospital departments that also have a presence in the research institute: the Department of Otolaryngology/ENT (Ears, Nose, and Throat), the Discipline of Medicine, the Rheumatology Unit and the Neurology Unit.

During group formation, The Team believed it was important to establish a "Memorandum of Understanding" between its members. The document was intended to set up an ethical collaboration, as some members felt they had not been treated respectfully in previous research teams in which they had worked.[5] For example, some members believed their contributions to previous projects were not recognized in terms of authorship. Another member said they had been irritated previously by certain researchers in the mind of "using other people to just get what you want." This meant people had contributed their knowledge and skills on a project with little acknowledgment or compensation. Therefore, to minimize the development of negative sentiments, The Team wanted an amicable atmosphere characterized by professional interactions among respected peers. Hence, the Memorandum of Understanding was seen as a way to promote ethical collaboration between the various individuals in the group. Some of the points included in the Memorandum of Understanding were as follows:

- The Team is greater than the sum of its parts.
- Each team member is a unique individual.
- The Team operates through a consensus framework.
- The direction of The Team is arrived at through discussion and dialogue.

This approach to working was established as a means of creating a healthy collaborative environment to carry out their research work.

The research direction of The Team was about understanding the mechanisms underlying chronic inflammation, which seriously impacts on a person's quality of life. Generally, inflammation is part of the body's healing process, however, chronic inflammation is a "maladaptive response that involves active inflammation, tissue destruction and attempts at tissue repair" that occurs for a prolonged period of time (Weiss, 2008, p. 427). The Team was specifically focused on chronic inflammation caused by diseases such as asthma, sinusitis, arthritis, and stroke. It was believed that there were underlying features of chronic inflammation

present in all these diseases, which could be studied from various angles.

As outlined in the funding application, The Team was to conduct basic research, such as investigating "the molecular and cellular mechanisms [i.e., processes] of inflammation underlying chronic disease." This would then progress to medical research, such as "developing pre-clinical [i.e., animal] models of inflammatory disease." The knowledge gained from the basic and medical research would help determine the types of clinical applications that would be developed or applied through various experiments to observe their effects on inflammation across the diseases.

The Team comprised seven Chief Investigators (4 female and 3 male), who were the main drivers of the research on chronic inflammation and were key contributors to the project's development and direction. A further 15 personnel (4 female and 11 male) were to perform a variety of functions to support the research work, thus The Team initially consisted of 22 people. However, fewer people were involved because some persons withdrew themselves from The Team once their work started.

The Team included researchers who had been educated, trained, and/or worked overseas in places such as Africa, Asia, Europe and the United States. The Team comprised the following people:

- Basic scientists—professionals who hold tertiary science qualification(s) and often conduct basic research throughout a wide range of scientific disciplines.
- Medical scientists—professionals who hold tertiary science qualification(s) but work more on applied research projects that are specific to medical research.
- Clinician-scientists—also known as physician-scientists, with a tertiary qualification and professional registration to practice medicine, and also a postgraduate science qualification.
- Clinicians—who hold a tertiary qualification and professional registration to practice medicine, and may have some additional training or experience in medical research.
- Postgraduate research students—who drew their professional identity from their respective disciplinary fields of basic science, medical science, and/or medicine.

Due to their education or training, some of The Team members identified with more than one professional identity. For example, there was a clinician-scientist who worked in a clinical capacity and also held a PhD with a basic research orientation. Overall, the composition of The Team suggests they are aligned to what Woolf (2008) describes as T-1 translational research, as the group was composed of those in the scientific and medical spheres, along with their research being mainly geared at utilizing basic and medical research for the development of therapeutics.

There were several reasons why members of The Team believed they needed to collaborate on this project, as outlined in a PowerPoint presentation they gave during a seminar in 2009. Reasons included the "cross-fertilization . . . [of] new research ideas" and the sharing of "new ideas and techniques" that they brought to the group or that emerged from their interactions outside their respective hospital departments.

While carrying out their translational research, The Team was evaluated through key performance indicators. Some of the quantitative outputs expected to be generated (as determined by the research institute and the funding body) included success in attracting further external funding, publications in peer reviewed journals, and patents or the development of other intellectual property with industry potential. Apart from placing these measures on The Team's performance, the funding body and institute tied funding to the training and career development of early career researchers in The Team, which included postdoctoral fellows and advanced clinical trainees.

Observations and Social Exchanges

From observation and conversation with the primary researcher (first author), it became clear that The Team were extremely excited about their collaborative venture. It was new and different from the established research groups they had worked with in the old medical research building, prior to the relocation. This was expressed in a presentation they made to their research institute, where a member of the audience said this research team had truly taken up the requirements of the grant by creating links that crossed the traditional boundaries between various research groupings within the organization.

Unfortunately though, their excitement was tempered by the fact that their work occurred against a backdrop of complications. During interactions with the primary researcher (first author), it became clear that scientific work has changed over the years, which, for some, was a source of irritation or frustration.

Bill, a researcher with many years of experience in medical research, was quite concerned about those researchers who were primarily focused on their own scientific careers and the subsequent impact they had on fellow researchers, and the quality of science being produced in general. He was angered at how the PhD experience for many students was no longer an opportunity for them to truly think critically; rather, they were often "fodder" for larger research projects headed by the well-funded and powerful senior researchers. He also missed the days when "good results" in the laboratory were themselves sufficient rewards that made his work worthwhile, rather than how many grants one accumulated.

Another participant, a basic scientist, explained the impact of increased administration and managerial monitoring of scientists by way of analogy through a PowerPoint

Presentation on the Internet titled: *The Ant: A Fable . . . or May be Not . . .* The narrative is about an ant who is very productive and content with her work. The ant's boss believes he could increase her productivity by hiring a supervisor, who then needs their own staff and other resources. In the end, increased managerial monitoring leads to the ant being burdened by "this new plethora of paperwork and meetings which used up most of her time" and "the Department where the ant works is now a sad place, where nobody laughs anymore and everybody has become upset." She is then fired when a hired consultant believes the department is overstaffed. In a similar fashion, scientists who are not able to keep up with administration and managerial demands may find themselves out of work.

Medical scientists and basic scientists were not the only ones irritated. There also seems to be a professional culture where clinicians who engage in research can only provide time to the research project when their main work in patient care has been addressed. Clara, a senior clinician, said, "One thing I find frustrating especially with doctors in research is that they seem to think [research] is not part of their core business, so they do a lot of this thing where they have research meetings after hours." In turn, this need to attend to patient care first over research extends the working day for clinicians and other researchers, which comprises the work/life balance.

Within The Team, a recurring point of discussion was the increased time being spent on administration rather than scientific work. Performing administrative tasks meant there was less time for students or early career researcher mentoring, the enjoyment that came from doing scientific experiments, discussing science, and creating research outputs, such as preparing and fine-tuning manuscripts for journal submission. This issue was brought to the fore during a meeting between The Team's members. Part of their funding was to support what they considered to be an administrative arm of the research institute. Thus, they believed the administrative arm should then be able to assist them with at least some of their administrative tasks. The Team attempted to alleviate their administrative work by writing a letter to the director of the institute asking for certain administrative tasks to be redistributed. The director replied in another letter that current resources would not permit this but "at a broader level we are attempting to address frustrating barriers to efficiency" through work on the "Management Committee," which was a newly formed group that represented members of the research facility.

A significant issue for The Team was how they could do their translational research work, along with the administration work, whilst located in an organizational context that did not seem to be helping them on administrative tasks. Further, they were part of a broader research culture that at times tainted the joy and reduced time for actual scientific research.

Cased-Based Themes

In light of the case description of The Team, we now move to exploring themes that emerged from our case with community of practice theory. This provides a means to investigate the extent to which The Team can be considered a community of practice. Moreover, the theory is a framework to continue to explore the social relations and organization between the members because their work is anchored in learning within an organizational context.

Coming Together

Participation is the "process of taking part" and also attends "to the relations with others that reflect this process" (Wenger, 1998, p. 55). In other words, when a community of practice is being set up, people interact with each other to make it happen.

However, the impetus to work together relies on *broader strategies*. From a managerial point of view, strategy is a "general plan to reach long-term objectives" of an organization (Certo, 2000, p. 168). In particular, it seems there was a strategy developed by a managerial element within the research institute, known as the "Policy Committee," that together with the benevolent foundation provided funding to The Team. Sally, a scientist, suggested that the formation of The Team was possible due to these *broader strategies*. She went on to say, "I suspect, in terms of strategy, would it be the Policy Committee and the [benevolent] foundation, looking at how we could move things on" to "introduce some of those changes of having people work together et cetera, so there was big picture strategy." The phrase "big picture strategy" indicates that overarching organizational elements, such as the institute's management in conjunction with a benevolent foundation, set up conditions within the research institute to allow people to collaborate with members from different research divisions in the institute. In this situation, *broader strategies* were required to encourage people to work with each other.

Although *broader strategies* demonstrate that an interest to work together was influenced by external forces, The Team needed to develop *common interests*. The most important shared interest was the concern about researching the mechanisms of chronic inflammation. Bob, a scientist, noted that this was developed in the group formation stage as there was:

> Common knowledge that, okay, rheumatology has an inflammatory interest. You know maybe the surgery department might have had an inflammatory interest. You approach various people and say you know how much of your work might interact with this [i.e., research interest in inflammation] and if the surgery people turn around and say: "Oh we're really more interested in this." That expires and you go off, and you look for somebody else.

A medical scientist, Pauline, also added that the *common interests* were further developed when other people in the institute heard about the potential project. Since chronic inflammation was a common feature among them all, they began to think how they could fit into The Team: "Then it

sort of becomes a shared thing and people become enthused and passionate and excited."

Community of practice theory views *common interests* as fundamental for a "joint enterprise" and involves the "negotiated response to their [The Team's] situation and thus belongs to them in a profound sense, in spite of all the forces and influences that are beyond their control" (Wenger, 1998, p. 78). Although it may seem that members of The Team were encouraged to work together through managerial initiatives and grant incentives, the notion of a joint enterprise suggests something much deeper about the human condition—the desire to belong to a group and create something that cannot be achieved by an individual alone. For instance, one medical scientist, in a stream-of-consciousness, recalled how The Team developed their *common interests*:

> We just met weekly didn't we? And the different personalities kind of took over, so some people were good at one thing and others good at another but . . . I guess it, it did more than money, whilst the information is still with common interest so it benefits, so research to be studying the same topic and sharing tissues and samples.

The phrase, "it did more than money" implies that funding was not the main driver for these professionals to collaborate; rather, it was a pretext for their desire to collaborate in an organizational environment that seemed to complicate prospects of "human flourishing" through work (Alvesson, Bridgman, & Willmott, 2011, p. 8). They discovered their *common interests* at various "get togethers," where they considered how each person could make a contribution to the larger project with the unique knowledge they had. There also was a willingness to share materials for their research project in terms of tissues and samples, which relates to the joy of giving. With this in mind, *common interests* are not simply about scientific knowledge as related to the project. These *common interests* were underpinned by a sense of altruism because these professionals wanted to belong and make contributions to developing their translational research project.

In this case, apart from the *broader strategies* encouraging people to collaborate, the members took action by finding *common interests* for the purpose of working together. Members utilized the "common knowledge" of the existing groups within the institute as a starting point to develop a research direction that was distinctly owned by The Team. This area of research was created by each professional's desire to work together on a rewarding project, where sharing their expertise and skill would provide personal and collective satisfaction.

Finding *common interests* as linked to personal desires is also grounded in a sense of participation and "relations with others that reflect this process" of forming a group (Wenger, 1998, p. 55). This suggests there are some behaviors that aid people in making the decision to work with each other.

Behaviors are defined here as embodied states of thinking and emotion that manifest as observable human actions, which for this Team is encapsulated in the subtheme of *being open. Being open* means that during the group formation stage, Team members had a sense of hospitality, experiencing a state where people were welcoming and giving. This subtheme of *being open* was demonstrated by the efforts that Team members made to find ways to share knowledge and resources for the research, as one member stated, "It was also people being generous and looking at how we could work together because sometimes people might be a bit protective." This quote also alludes to how people employed in scientific research may not be so forthright in sharing scientific resources, such as laboratory materials or knowledge (e.g., Hackett, 2005; Porter, 2013). It further emphasizes how The Team was focused on developing an ethical collaboration from the start of their work together, which was then enshrined in their Memorandum of Understanding.

Learning From Others

Community of practice theory assisted in overturning the mainstream pedagogical discourse "that learning is an individual process . . . that it is best separated from the rest of our activities, and that it is the result of teaching" (Wenger, 1998, p. 3). Community of practice theory takes the view that "learning is a fundamentally social phenomenon, reflecting our own deeply social nature as human beings capable of knowing" (Wenger, 1998, p. 3). This social understanding of learning recognizes that people engage with each other to make learning relevant to their shared interests.

Learning was clearly valued by The Team, as evidenced from this comment by one member when asked what things they had in common:

> A desire to learn, I guess a desire to understand information probably. I think each person comes with their own vision on that but we're all heading toward the same direction . . . we're all working on the same big framework. Each of us have got a group of tiles that we're putting in.

Learning was underpinned by The Team's desire to find out more about the underlying causes of chronic inflammation across several diseases, which would then progress to testing the relevant clinical applications. One member of The Team describes each professional in the group as having a "group of tiles," which like a mosaic fits together to create a picture. The metaphor describes what each member brings to project through their education, training, and experience as researchers. The act of "putting in" what knowledge they bring led to the process of building relationships with one another, to develop experiments to learn more about chronic inflammation.

A social approach to learning was identified under the subtheme of *learning in practice*. Wenger makes distinctions

between various ways people can learn in practice; however, of particular relevance is the idea of "legitimate peripheral participation" (Wenger, 1998, p. 100). Legitimate peripheral participation is necessary for the continuation of a community of practice; it gives certain people who are interested in joining a group the opportunity to become full-fledged members, by learning the knowledge and skills that are relevant to the group (Wenger, 1998). Legitimate peripheral participation is a situation where those members with less experience are given "exposure to actual practice . . . a lesson that is *about* the practice but takes place outside of it" (Wenger, 1998, p. 100). These persons witness actual work practices, but may not be fully involved in what is being done.

For this research Team, legitimate peripheral participation was identified as a form of *learning in practice*. Mark, a junior scientist, was able to describe the experience of watching and asking questions of more experienced members, in this case Mary, Geoffrey, and Joe, who were conducting laboratory work with euthanized mice:

> From the mouse work that we did, just the other week, um there was a lot of, I guess while, um being the baby member watching Mary, Geoffrey and Joe do what they do . . . I guess picked up their technique through prior experience. But then I was sort of the . . . person on their shoulder (laughs), having a look over to see what they're doing and discussing it as they're doing it.

The term "baby member" signifies the participant's identification as a person who does not have adequate knowledge and skill to conduct this work. Mark noted he "picked up their technique" through watching and asking questions from the more experienced members of The Team. *Learning in practice* in this group took place while laboratory work was being done with junior members learning by watching more highly skilled persons complete a task at hand.

Senior members of The Team also benefitted from *learning in practice*. In the description that follows, Alex, a senior medical scientist, speaks about how a new technique for Polymerase Chain Reaction (PCR) work was introduced to him by John, a PhD student, on The Team:

> I will teach John the way that we do it in the lab and I've picked up that from past experience myself from previous work and the standard operating procedures . . . But I'm also willing to learn and John's brought in a technique that he uses in the university which is different to what we're using and I see that as the next page if we ever you know did further PCR work . . . it actually halves the amount of DNA from a sample that we're using and still gets a good result. So, he's got a different way of doing things so I'm actually learning as I'm teaching.

Wenger (1998) highlights that "encounters between generations are an aspect of practice that is most often understood as learning" (p. 99). Knowledge learnt in practice is acquired by the less experienced and usually younger person due to the senior person providing some type of learning

opportunity. However, Wenger points out that *learning in practice* can be "shared across generational discontinuities precisely because it already is a social process of shared learning" (p. 99). Even though Alex set up a situation where John could learn how PCR work was done in the institute, John taught him a more effective technique which used less DNA material. Accordingly, *learning in practice* is a process that challenges the idea that senior generations are responsible for teaching. Learning was thus infused in the practice of this Team with all people widening their skill sets as they interacted with each other.

Still, there are difficulties with learning in practice, which compromises the value placed on learning in practice. One of the difficulties identified was that there are *time constraints* imposed on learning from others. Within The Team, time seemed to be something that was measured and treated as a scarce resource. Bill, a PhD student, emphasized time restrictions on learning from others by revealing that more experienced Team members only had "a finite amount of time" to demonstrate lab techniques. It has been noted that administration work for many persons on The Team was in part responsible for the shortage of time to work on actual scientific research, which includes practical learning. Although it is evident that *learning in practice* did occur in this Team, more time for learning would have been welcomed, as they each had a passion for scientific research and enjoyed learning from each other, especially for the benefit of their translational research project.

The limited time for learning was an issue for The Team because "to support learning is not only to support the process of acquiring knowledge, but also to offer a place where new ways of knowing can be realized" (Wenger, 1998, p. 215). To put it another way, there are additional benefits in fostering learning because different types of knowledge can be created that ensures a community of practice's longevity and relevancy in the translational research arena.

Shared Competencies

Skills and other things that are required for team members to conduct their work properly are akin to the "shared repertoire" that is present in any community of practice (Wenger, 1998, p. 82). In community of practice theory, the:

> Repertoire of a community of practice includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice. (Wenger, 1998, p. 83).

Hence, there are various resources that members can draw upon for The Team's continuation as a community of practice.

A way of identifying shared competencies, which can assist in assessing whether the research team is a community

of practice, is to determine whether they have a "rehearsed character" (Wenger, 1998, p. 83). In relation to this Team, a significant shared competence was its *knowledge of science*. This shared *knowledge of science* made the research possible; as one participant put it, "We've all basically done some kind of science background, so we all understand the scientific method; we all understand the procedures that we expect to go through." With this *knowledge of science*, members were able to follow through with their translational research work. This shared *knowledge of science* suggests that unlike previous studies, there were fewer issues with the professional divide between basic science and medicine (Cribb et al., 2008; Wainwright et al., 2006; Wilson-Kovas & Hauskeller, 2012) as science underpins both disciplines.

In building from this *knowledge of science*, members of The Team recognized they were *working as a group*. The subtheme of *working as a group* was brought to the fore by Sue, a clinician. She reflected on why the group was so cohesive, when her experience of other research teams was quite different:

> One of the things that struck me at the [research team's] meetings and one of the reasons I think some of the members came to us from other groups was that it's a . . . very professional sort of group. All the people who are in [the research team] are very professional about their interactions. I think um and I can say having sat on some other groups and seeing some other scientists and clinician-scientists that not all, not everyone, behaves in that kind of professional manner towards each other.

The sense of professionalism that is tied to *working as a group* refers to group-motivated behaviors, which were felt by Team members to be orderly and fair. For example, in formal meetings, authorship was discussed and attempts were made to ensure that people received credit for their contributions to the research. Or to put it more bluntly, as a member stated, this is "a group where everyone is willing to . . . give due credit to other people's ideas and not steal those ideas."

Their ability of *working as a group* is anchored by the notion of *equality*, as explained in the words of one scientist on The Team:

> We're equals as well aren't we? We all treat each other as people who have your own expertise. Whereas in some of the other groups there still is that leader, kind of looking down and . . . I don't think we'll ever have that problem.

Their way of dispelling with hierarchical ways of working was achieved by a preexisting sense of *equality* among the members, which was formalized by the Memorandum of Understanding they produced during the group formation stage. What is interesting here is that *working as a group* and having a sense of *equality* between Team members challenged the traditional way groups in this organization function. This is an example of Alvesson and Willmott's (1992)

idea of "microemancipation" as there are "temporary movements that break away from diverse forms of oppression" (p. 447). The oppression they were combating was the pervasive mentality of behaving in a manner that would treat people as a means to an end for one's own research career advancement, which is dissimilar to previous findings where "a tension persists between collaborative ideals of new bioscience set-ups and the individual instincts of career development" (Porter, 2013, p. 6). The shared repertoire of The Team implemented a different form of organizing.

Conclusion and Future Research

The case study underscores the technical, social, and organizational complexity of collaboration in translational research by providing insights into collective lived experiences of researchers in a translational research team, with particular attention to the group's development.

The case description detailed The Team's composition and how they aimed to create amicable relations between themselves. In this organizational context, they were rather unique as the individuals working together had broken away from the traditional research groupings. They also needed to work with various complications, which included issues with persons in science concerned with their individual careers, increased administration and managerial monitoring, along with working hours of clinicians on research teams, and the lack of direct organizational supports.

The case-based themes provided further contextual information about The Team and offered an avenue to explore whether they could be considered a community of practice. Equally important, this discussion provides further information into how The Team worked together and organized themselves. Although wider organizational structures had provided an invitation for collaboration across the conventional research groupings, the members of The Team created their own joint enterprise through sharing gifts of knowledge by *being open* and were *learning in practice* from each other in numerous ways. What is most interesting is that their shared repertoire showed a commitment to *working as a group* as underpinned by the sense of *equality* between members. This suggests The Team organized themselves in a less hierarchical fashion and had less tolerance for a general professional culture of individualized career advancement (Porter, 2013). The case study was able to reveal an alternative way professionals organized themselves for a translational research project and more research is needed to further appreciate the ways such professionals organize.

The Team also had a sense of being a part of a community of practice given that they developed a shared research interest and had some common behaviors and values that made their learning possible. Questions remain about the optimal level or perhaps the quality of *learning in practice*, as administration work for all researchers and patient care for clinicians took time away from learning from others. What then

is evident from the analysis, and most unfortunate, is that The Team were not able to fully realize the potential of learning from each other.

To better understand why learning was not optimized, it would be now worthwhile to investigate how the wider sociopolitical context defines, values, and regulates what counts as learning. Exploring learning in such a manner may create opportunities to widen the parameters of what and how professionals on translational research projects learn.

Notes

1. For more information on what translational research is, Woolf's (2008) seminal article is an indispensable introduction.
2. Translational research projects require professionals from various disciplines and subdisciplines, such as basic scientists and physicians (Woolf, 2008). The professional identities these people bring to a collaborative venture may lead to certain frictions. Coller (2008) provides rather astute cultural observations between basic scientists and physicians, which help one imagine how these different professional identities could face some challenges when working together on translational projects.
3. The scope of Therapeutic Innovation Australia seems to take a less broad understanding of translational research than the U.S. National Center for Advancing Translational Sciences. This U.S. governmental entity has an ambitious translational research program that understands that the "inclusion of patient-centered research, community engagement, training, dissemination science, and behavioral research is extremely important to the translation and application of basic science discoveries" (U.S. House of Representatives, 2012, p. 1137).
4. The process of translational research, which has an extensive and fascinating history, is not a recent phenomenon in the sciences (see Hetzel, 2005; Keating & Cambrosio, 2012; Löwy, 1997; Martina, Brown, & Kraft, 2008).
5. Ethical collaboration is an observance of "virtuous character traits" in the scientific community that minimizes harm to fellow colleagues, which includes individuals being "other regarding as well as self-regarding, empathetic and committed to the collaboration as well as the goal or goals of the collaboration" (McGowan, McGowan, & McGowan, 2011, p. 129).

References

Alvesson, M., Bridgman, T., & Willmott, H. (2011). Introduction. In M. Alvesson, T. Bridgman, & H. Willmott (Eds.), *The Oxford handbook of critical management studies* (pp. 1-26). Oxford, UK: Oxford University Press.

Alvesson, M., & Willmott, H. (1992). On the idea of emancipation in management and organization studies. *The Academy of Management Review*, *17*, 432-464.

Benington, J., & Hartley, J. (2006). Co-research: Insider/outsider teams for organizational research. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 361-371). London, England: SAGE.

Bingham, A. (2011). Foreword. In A. J. Williams, M. A. Hupcey, & S. Ekins (Eds.), *Collaborative computational technologies for biomedical research* (pp. xi-xiii). Hoboken, NJ: John Wiley.

Certo, S. C. (2000). *Modern management*. Upper Saddle River, NJ: Prentice Hall.

Chubb, I. (2012). *Can Australia afford to fund translational research?* Canberra: Australian Government.

Coller, B. S. (2008). Translational research: Forging a new cultural identity. *Mount Sinai Journal of Medicine*, *75*, 478-487.

Commonwealth of Australia. (2009). *Powering ideas: An innovation agenda for the 21st century*. Canberra: Australian Government.

Contopoulos-Ioannidis, D. G., Ntzani, E., & Ioannidis, J. P. (2003). Translation of highly promising basic science research into clinical applications. *American Journal of Medicine*, *114*, 477-484.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). London, England: SAGE.

Cribb, A., Wainwright, S. P., Williams, C., Farsides, B., & Michael, M. (2008). Towards the applied: The construction of ethical positions in stem cell translational research. *Medicine, Health Care and Philosophy*, *11*, 351-361.

EATRIS (European Advanced Translational Research Infrastructure in Medicine). (2014). *EATRIS organisation*. Retrieved from http://www.eatris.eu/about/organisation.html

Fournier, V., & Grey, C. (2000). At the critical moment: Conditions and prospects for critical management studies. *Human Relations*, *53*, 7-32.

Hackett, E. J. (2005). Essential tensions: Identity, control, and risk in research. *Social Studies of Science*, *35*, 787-826.

Hetzel, B. S. (2005). *Chance and commitment: Memoirs of a medical scientist*. Kent Town, Australia: Wakefield Press.

Keating, P., & Cambrosio, A. (2012). *Cancer on trial: Oncology as a new style of practice*. Chicago, IL: The University of Chicago Press.

King, N. (2006). Using templates in the thematic analysis of text. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 256-270). London, England: SAGE.

Lander, B., & Atkinson-Grosjean, J. (2011). Translational science and the hidden research system in universities and academic hospitals: A case study. *Social Science & Medicine*, *72*, 537-544.

Lave, J., & Wenger, E. C. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Löwy, I. C. (1997). *Between bench and bedside: Science, healing, and Interleukin-2 in a cancer ward*. Cambridge, MA: Harvard University Press.

Martina, P., Brown, N., & Kraft, A. (2008). From bedside to bench? Communities of promise, translational research and the making of blood stem cells. *Science as Culture*, *17*, 29-41.

McGowan, R. J., McGowan, M. K., & McGowan, G. J. (2011). Ethics of collaboration. In A. J. Williams, M. A. Hupcey, & S. Ekins (Eds.), *Collaborative computational technologies for biomedical research* (pp. 121-131). Hoboken, NJ: John Wiley.

McKinnon, R. (2011). Translating health discovery into clinical applications. *Australasian Biotechnology*, *21*(3), 13-14.

Morgan, M., Barry, C. A., Donovan, J. L., Sandall, J., Wolfe, C. D. A., & Boaz, A. (2011). Implementing "translational" biomedical research: Convergence and divergence among clinical and basic scientists. *Social Science & Medicine*, *73*, 945-952.

National Institutes of Health. (2014). *Organization and background*. Retrieved from http://www.ncats.nih.gov/about/org/organization.html

Oborn, E., & Dawson, S. (2011). Learning across communities of practice: An examination of multidisciplinary work. *British Journal of Management*, *21*, 843-858.

Porter, J. (2013). Making "social" scientists: Institutionalising interaction in neuroscience. In *London & Brighton Translational Ethics Centre (LABTEC) progress review, 2012-2013* (pp. 5-6). London, England: London & Brighton Translational Ethics Centre.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63-75.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: SAGE.

U.S. House of Representatives. (2012). *House Report 112-331-Military construction and veterans affairs and related agencies act, 2012*. Washington, DC: Government Printing Office.

Wainwright, S. P., Williams, C., Michael, M., Farsides, B., & Cribb, A. (2006). From bench to bedside? Biomedical scientists' expectations of stem cell science as a future therapy for diabetes. *Social Science & Medicine*, *63*, 2052-2064.

Weiss, U. (2008). Inflammation. *Nature Insight: Inflammation*, *454*(7203), 427.

Wenger, E. C. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.

Wilson-Kovas, D. M., & Hauskeller, C. (2012). The clinician-scientist: Professional dynamics in clinical stem cell research. *Sociology of Health & Illness*, *34*, 497-512.

Woolf, S. H. (2008). The meaning of translation research and why it matters. *Journal of American Medical Association*, *299*, 211-213.

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