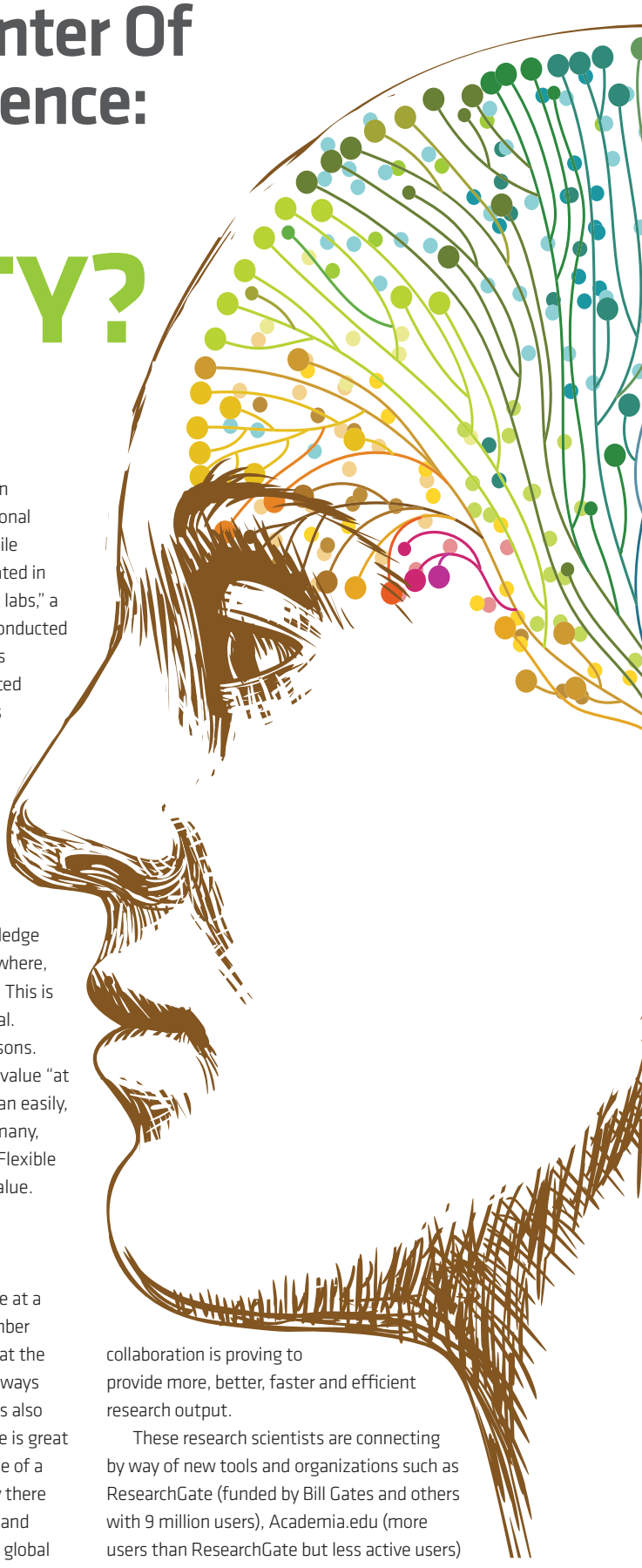
Dubai - International Center Of Medical Research Excellence:

FANTASY OR OPPORTUNITY?



By Brian DeFrancesca, CEO, Ver2, Dubai, UAE

Firmly standing on sand

In 1960, if you were standing in the center of the main runway of the Dubai Airport, you would be in the middle of 1,800 meters of hard packed sand, at risk of getting run down by an occasional Douglas DC-3. If at that time you had said, much less committed to writing, that one day Dubai would be home to the busiest international airport on Earth – you would have certainly received questionable looks. For on the surface, there were many more reasons to believe this was not a possibility, than there were to give it serious consideration. Better bets would have been wisely placed on London or Hong Kong. However, as you may know - today, the Dubai International Airport is the busiest international airport on Earth. And today, I offer that Dubai can be an international center of excellence for medical research. I am not saying that Dubai will soon welcome hordes of the best and brightest research scientists from around the world, who will eagerly leave their homes and loved ones and set up life here in the UAE. Because that is not likely to occur – not because Dubai is not a wonderful place to live and work; but because generally speaking, experienced people with families tend to want to stay close to home; and also – and key to this writing - they no longer have to relocate to find work and share their value. In these times of "Connected Minds," the way and where of medical research is changing daily, for the better. Research scientists are being freed from their lab benches and are now able to span the globe with their knowledge and experience.

Wet Labs, Dry Labs - the rise of the research "Knowledge Worker"

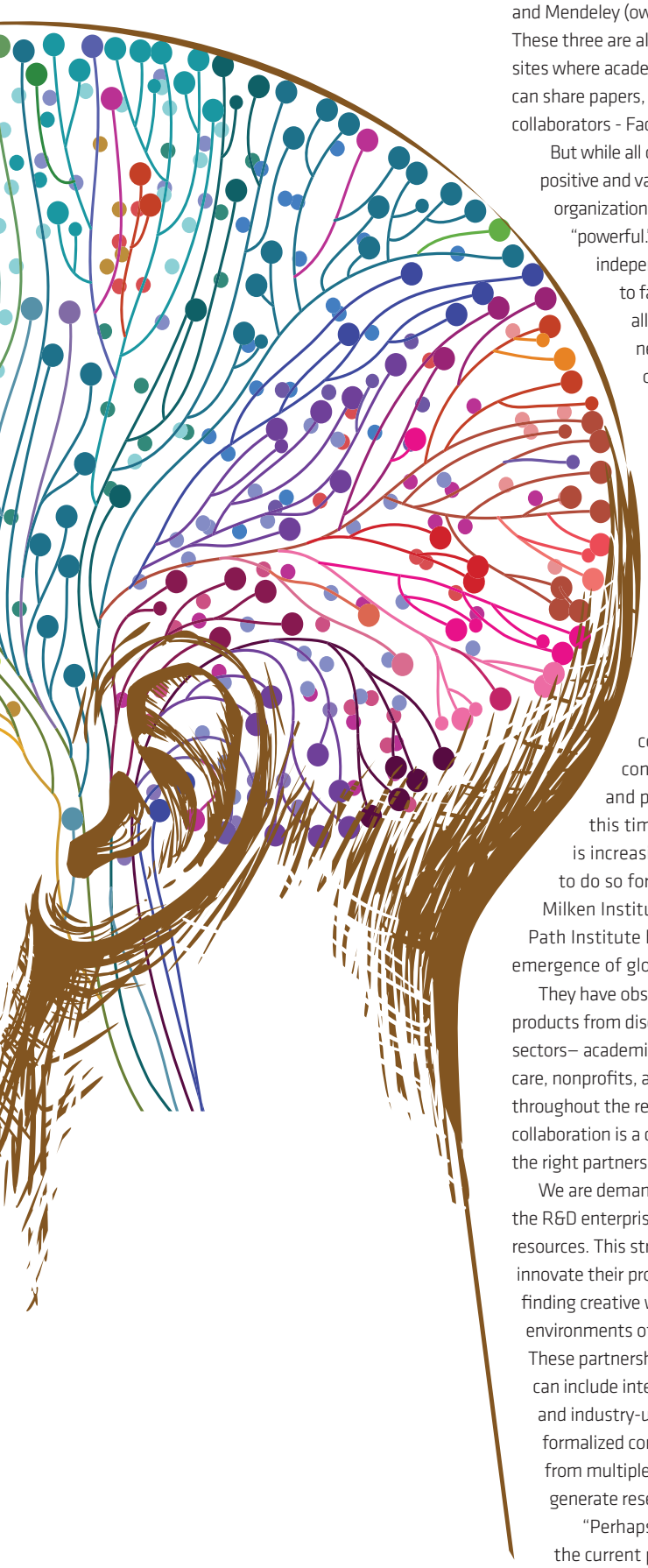
There is the romantic image of the lone research scientist, conducting late night experiments in the dim dank laboratory - surrounded by beakers, and flasks of mysterious liquids being heated and illuminated by the ever present Bunsen burners – and then, there is the occasional eureka moment of discovery. And while certainly a lot of work and value is created in these "physical" laboratories – or "wet labs," a significant percentage of research is conducted in "Dry Labs." Dry labs are laboratories where computers or computer generated models are used by research scientists for analysis. Dry labs are the realm of the research knowledge workers – scientist who work and provide their value "in silica" or digitally, and are thus not confined to physical places. Advances in connectivity and technical mobility are resulting in "Dry Lab" oriented scientists (Knowledge Workers) being able to work from anywhere, at any time, for anyone and everyone. This is game changing and certainly non-trivial.

This is important for two very reasons. Knowledge workers can provide their value "at a distance" and knowledge workers can easily, and often "collaborate" with one, or many, others in a highly flexible manner. "Flexible Global Collaboration" = exponential value.

Exponential International Collaboration

The ability of researchers to collaborate at a distance, with many others, has a number of obvious benefits, one of which is that the research never stops, as someone is always "on the clock" as the world turns. It has also been proven time and again, that there is great "Wisdom in Crowds" to borrow the title of a popular recent book. This is not to say there is still not a need for isolated research and introspection, but this, combined with global collaboration is proving to provide more, better, faster and efficient research output.

These research scientists are connecting by way of new tools and organizations such as ResearchGate (funded by Bill Gates and others with 9 million users), Academia.edu (more users than ResearchGate but less active users)



and Mendeley (owned by Elsevier publishing company). These three are all variations on social networking sites where academics, scientists and researchers can share papers, ask and answer questions and find collaborators - FaceBook for scientists.

But while all of this connecting and sharing is positive and valuable, it lacks the centralizing organization and governance that will make it truly "powerful." Just as all of those passengers and independent drivers need UBER and Careem to facilitate their "value exchange," and all of those book sellers and readers need Amazon, and persons in search of a trusty pillow on which to lay their heads while traveling need AirBNB – the global medical research community cannot just connect in some loose unorganized fashion, there is a need for coordination and governance and this is happening in the form of Medical Research Consortiums.

The Rise and Rigor of Consortia

For years research has been collaborative and marginally connected and now that for all intents and purposes, everyone is on-line all of this time - this collaborative connecting is increasing exponentially and will continue to do so for quite some time. Both The Milken Institute and the organization Critical Path Institute have looked closely at the needed emergence of global research consortia.

They have observed that getting new medical products from discovery to patients requires all sectors– academia, industry, government, clinical care, nonprofits, and philanthropy– to work together throughout the research and development process. But collaboration is a complex endeavor, and integrating the right partners is far from easy.

We are demanding increased productivity from the R&D enterprise in an environment of decreasing resources. This stress is forcing all stakeholders to innovate their processes, and a growing number are finding creative ways to collaborate within open environments of data- and knowledge-sharing. These partnerships span a range of models and can include interdisciplinary academic initiatives and industry-university alliances, as well as large formalized consortia that encompass researchers from multiple sectors who share resources to generate research results that are broadly needed.

"Perhaps this increase can be attributed to the current paradigm for developing medical products, a long, costly and risky endeavor, especially for a single group to pursue alone. It could also be a sign of increased trust and willingness to partner. Efforts to redefine this paradigm by consortia are centered on collaborative approaches that leverage expertise and resources of a wide range of partners to create tools and knowledge that advance the research objectives of all stakeholders This model of partnership provides a neutral ground to coordinate the sharing of risks, costs, resources, data, and expertise in the pursuit of a unified research mission, while addressing the differences in culture and expectations that each participant brings to the partnership."

According to "FasterCures" There was only 1 new collaborative consortia launched in 1995 but that number has increased every year since then, so that in 2012 there were 51 new consortia launched, and the march goes on.

Over the last few years, discussions on the future of research have focused on the step after genomics -what is called "connectomics." Comments from a recent article are, I believe, especially telling and important to when it comes to Dubai's research future potential:

"Even more than molecular biology, neurobiology has been dominated by small or personalized science: think of Hodgkin and Huxley, Katz, Neher, Sakmann, Hubel, and Wiesel. Yet the requisite transgenic lines, optical and electron microscopy imaging regimens, sectioning tools, immunohistochemistry, data storage, and data analysis almost certainly will not all be found in the same institution. Multi lab consortia will probably be a central feature of this effort from its inception. Although we are beginning to see a few `big' neurobiology projects, a connectome project would require a culture shift in the field."

Dubai is not, and will not be, a place where serious research is conducted under the "old model" of expecting the diverse large number of high quality researchers to relocate full-time – but – the future of a "Multi Lab Consortia" as outlined above demands a neutral, central, "coordinating organizing nexus" – and this is where Dubai can leap in. We can convert perceived current "weakness" into a strength.

Thinking this way, makes me think of Switzerland – which today we see as a wealthy country, a global money hub and a source of fine watches. But not that long ago, Switzerland was the poor little brother of Europe. Dubai can become the "Switzerland" of medical research and education – because currently, ▶

Dubai is not a global clinical esearch "threat." Dubai is a perfect location for virtual "collaborations." And the world not only needs these global collaborations, but sees and acknowledges this important need.

The International Brain Initiative

In 2011, the World Economic Forum and Harvard University predicted mental health conditions would cost the global economy $6 trillion by 2030. Surely brain science deserves significant research attention. However, as good as the science is today, there is a need for additional basic research as well as a way for the brain science community to work together more effectively, from sharing data and research tools, to developing standards, to supporting student exchanges and visiting scientists. This is why the fundamental leap toward understanding the brain can only be made through international collaboration among governments, the private sector, academia, and philanthropic organizations. This will be essential for tackling a task as complex as understanding the human brain. Toward this end, the United States, in collaboration with Japan, Germany, Argentina, and the UN Conference on Trade and Development, announced the launch of an International Brain Initiative, part of which is a virtual International Brain Station, to enhance and facilitate global collaboration on both basic and disease-focused brain science research. This is only one example, of many global research collaborations, and there is a need for many more.

What could this mean for Dubai? Certainly there is a need for physical laboratories, staffed by technicians and some research scientists to conduct experiments with "fire and chemicals" but these can, are, and will be more so, integrated with global networks of collaborating scientists. But, not only human scientists...

"All Knowledge" and "Thinking Machines"

However, there is and will be more global connecting of much more than human scientists. While space does not allow addressing this in the much-deserved detail it requires, there are two hugely important trends that must be considered in all of this.

We are at a point when all human knowledge, will be available to everyone all of the time – to be quickly, effectively and efficiently accesses and analyzed. Everything will sooner or later be online, shareable and searchable. Cloud storage, sharing and access to information will increase as more and more institutions move to shared, cloud storage environments. This warehousing of all knowledge and information is occurring in parallel with unprecedented advances in computer assisted "thinking." Previously referred to as "Artificial Intelligence" and now mired in a wide array of terms from Massive Parallel Processing computers, to deep learning and Cognitive Computing – computers are getting smart, fast. Chess was a nice start, Jeopardy an interlude and GO a glimpse of the path we are on. Computers are already discovering drugs and coming up with their own scientific theories - without human help.

Knowledge was once kept in the minds of scientists, in books and journals and various other documents – and that was pretty much it. Over the years, this information, started to accumulate in facility based computers and then made its way to mobile computers, tablets, phones etc. Today, this information is being migrated en masse to the cloud where all human knowledge will soon reside. This vast repository of shared knowledge must be vetted, curated, cared for and shared.

Computers are today able to invent new scientific theory, without human help. They are able to quickly sort through that endless cloud of information/knowledge, they are also better than us at pattern recognition. They are powerful Synthetic Minds and will be connecting with, and supporting our collaborating biological minds.

We are moments away from having scientists continually connected everywhere all of the time. We will have all of human knowledge accessible to everyone and everything, and for this information will be quickly retrieved and analyzed by extremely smart and fast thinking computers ready to assist continually networked collaborating humans. And we are just beginning. What does this look like by the year 2020 and beyond?

EXAMPLES OF CONSORTIA

- Alzheimer's Disease Neuroimaging Initiative
- Biomarkers Consortium
- Chronic Collaborative Care Network
- Coalition Against Major Diseases
- Coalition For Accelerating Standards and Therapies
- Center for Integration of Medicine and Innovative Technology
- CoMMpass (Relating Clinical Outcomes in Multiple Myeloma to Personal Assessment of Genetic Profile)
- Quebec Consortium for Drug Discovery
- eTOX
- Foundation for the National Institutes of Health
- Health and Environmental Sciences Institute
- Innovative Medicines Initiative
- I-SPY2 (Investigation of Serial Studies to Predict Your Therapeutic Response with Imaging And moLecular Analysis 2)
- Myelin Repair Foundation Observational
- Medical Outcomes Partnership
- Polycystic Kidney Disease Outcomes Consortium
- Parkinson's Progression Markers Initiative
- Project Data Sphere
- Predictive Safety Testing Consortium
- Sage Bionetworks
- TransCelerate BioPharma

Increased collaboration; increased complication – the need for Nexus

Cooperation between the land based wet lab dwellers, the remotely collaborating knowledge workers, the digital warehouses of information and our new digital thinking assistants will not happen automatically. There will be a need for some sort of coordination. A trusted, neutral, central nexus to help make this all happen smoothly. In the same way the stability and neutrality of Switzerland made them a financial powerhouse, could the same occur in Dubai? It was not that Switzerland started out "rich." In fact, Switzerland was poor relative to their neighbors and the world. What they offered was their neutrality, their stability their work ethic, and their confidentiality.

What this means for Dubai and the region

I have had the good fortune of living and working in many parts of the world. I have noticed that very good healthcare requires very good doctors. Top-flight doctors tend to gravitate around areas with good medical education; and good medical education, almost always has a well-established research underpinning. Therefore, very good healthcare demands a very good research underpinning of some kind.

There are two related opportunities for Dubai and the UAE: To remotely access and ▶

utilize the growing global network of research scientists to support in country laboratories; and to also serve as a central governance body for global research consortia.

Medical research is one part wet work and several parts dry work. There is a need for wet labs that can be located in Dubai, and staffed with competent technicians as well as "some" research scientists. These wet labs can support global medical research consortia. As these consortia grow in size and complexity they admittedly need central organizations – a neutral, trusted body to help govern. Dubai has the visionary leadership and proven ability to execute on that vision.

To become a global star in medical research and education - the first inclination may be to reach out to big brand Western institutions for collaborations; however, this may prove to be too narrow and shortsighted approach. The West, and primarily the U.S.A., has certainly been the dominant force in Medical Research for most of our lives. This is because it has been where research has found the greatest support and has generated more than half the worlds research for many decades – the tides, however, are changing to towards Asia.

As quickly as investment in research and "new patents issued" is declining in the West, it is being more than made up for by tremendous increases in research funding and the issuance of new valuable -patents in Asia – specifically China. And Dubai is at the important crossroads of this transition. Dubai can serve as the central arbiter during this period phase change. Carpe Diem Dubai.

I am confident that Dubai can provide an innovative and flexible regulatory and legal environment, and also address the technical requirements such as data centers, connectivity and security.

Why I believe

Dubai did not become the busiest international airport on the planet, solely by organizing rocks, glass and steel. Shifting the center of gravity of the entire Aviation industry required that they attract the world to Dubai, and through Dubai. This required building global confidence and trust in the ability of Dubai to perform and provide; and that this will sustain into the future. The world of Aviation obviously believed in this. I moved my family here and started my company here in Dubai, because I am confident in the potential for this region – and specifically Dubai – to be central in the global connecting of minds. Back in 2008, the then chief executive of British Airways, Willie Walsh, warned that Dubai's plan was "to become the hub that links the world's biggest aviation market, North America, with its fastest-growing, Asia – and this link would bypass Europe altogether." The world does not "need" a busiest international airport – life would go on just fine if several airports were equally busy; however humanity will benefit through the global collaboration of medical research resources; and this collaboration, via consortia desperately needs a Center.May I say this now regarding Dubai and the world of Medical Research? There is a need for a global central "link" and Dubai is perfectly positioned to fill that position - by Connecting Minds of all kinds. AH

Brian de Francesca is the founder and CEO of the Dubai Based digital health services platform Ver2 – a innovative company that is connecting minds and more from around the world, to improve healthcare for everyone, all of the time, everywhere. Brian is a pioneer in the digitalization of medicine with over two decades of international healthcare experience.