June 26, 2020

The Honorable Lamar Alexander
Chairman, Senate Committee on Health, Education, Labor and Pensions (HELP)
455 Dirksen Office Building
Washington, DC 20510

Dear Chairman Alexander,

Thank you for your timely leadership in taking the first step toward securing our nation in preparation for the next pandemic. Celdara Medical is pleased to respond to your request for comment and recommendations for the Senate Committee on Health, Education, Labor and Pensions to consider as the Committee forms policy on pandemic preparedness.

We recommend that Senate HELP support a public-private partnership to identify, vet, develop, and make available for stockpile critical medical countermeasures built on the vast and untapped stores of innovation within our university system and government labs, and we wholeheartedly agree that we must act this year. Celdara Medical would welcome the opportunity to work with the Committee to provide structure and organization to such a partnership.

You think we weren't prepared for this, wait until we have a real global threat for our health security.

- Robert Redfield, CDC Director, Testimony to the House of Representatives, June 4, 2020

NIAID alone allocates $6B per year to the best and brightest infectious disease researchers in the world. Yet, due to the lack of a commercial market, the translational research and development required to turn inventions into innovative medicines, diagnostics, and devices, is left undone. As a country, we have tried myriad push and pull incentives to attempt to create markets, or carrots, or sticks, and yet today we still find ourselves woefully unprepared. Since incentives have proven insufficent, let's roll up our sleeves and let the work of actually developing pandemic security measures be our legacy. As you fully appreciate, this is simply too important an issue to be met with a variation on a failed theme.

CELDARA BY THE NUMBERS

- **68%** 10-year IRR
- **$60M** in funding
- **$500M** in exit value
- Highest AAGR in NH
  - 3 y in a row
- **500** assets thru diligence/y
- **8** newcos formed
- **8** clinical trials of new drugs
- **6** clinical trials supported by our diagnostics
- SBA Tibbetts Award
- SBA NH Small Business Person of the Year (Reder)

Celdara Medical was purpose-built to do the work of translational research and development. In our 12 years of growth, we have established strong relationships with the best research institutions in the country, a rich stable of assets in development, and a successful track record incubating innovation across indications, frequently in partnership with the NIH. Six years ago, we made the strategic decision to focus on infectious disease, not because of the commercial opportunity, but because the needs – for our nation and for humanity – were obvious. Celdara Medical, a for-

profit firm, implemented a strategy without a market. Concurrently, much of our industry was shutting down infectious disease R&D altogether. Today we are advancing innovative programs in antivirals (from Ebolavirus to SARS-CoV-2), antibacterials (broad-spectrum, and including against antibiotic resistant strains), and diagnostics. We are working with NIAID, USAMRIID, and BARDA, as well as numerous leading CROs, CMOs, and biopharma companies. There is no commercial market for this work, but for the sake of our patients and our nation, it must be done.

Lessons Being Taught by COVID-19

We must act today to protect the nation from the next infectious disease threats. The importance of this challenge has become painfully evident as the slow response to the COVID-19 outbreak and pandemic has resulted in the unnecessary death of 124,544 of our fellow Americans as of the time of this writing. The impact on the economy and requisite stimulus are both vast and well known. We must act – this year – to protect the nation from the next infectious disease threats.

Doing great things is hard. Doing great things during a global pandemic is harder. While certain vaccine platforms offer hope for relatively fast development, record-setting timelines dramatically increase risk and cost, and severely limit innovation and optionality. Further, and even if we are successful in bringing a COVID-19 vaccine to market in record time, many more than 124,544 Americans will have died, waiting. The repurposing of already-approved therapeutics designed for other indications is underway in more than 1,000 clinical trials. These drugs are known to be safe in their approved target population, and may or may not be safe in the context of COVID-19, but they simply weren't designed to treat COVID-19 and are therefore unlikely to be effective. That a generic steroid can modulate cytokine release syndrome is neither surprising nor curative. And while these 1,000+ trials are underway, *124,544 Americans have died, waiting*. Purpose-built therapeutics require years for discovery, preclinical, and clinical development, yet many initiatives have been launched since COVID reached our shores, during which time *124,544 Americans have died, waiting*. Developing medicines is difficult enough. Let's never again be forced to do it during a pandemic.

A stitch in time saves nine… orders of magnitude. While no two pandemics are alike, we can stop outbreaks before they begin, *if – and only if – we are prepared.* At a minimum, with appropriate preparation we can treat any clusters that are introduced to our country. If the world had medicines to treat or prevent the transmission of SARS-CoV-2, there would be no COVID-19. It could have been stopped in Wuhan. There would be no pandemic, no negative economic impact, and no devastating death toll. The difference between being able to intervene at the cluster stage and starting to develop mitigations at the pandemic stage is measured in tens of trillions, and yes, it could have been worse.

Stage of Contagion	Health Impact	Economic Impact	Examples	Comments
Patient Zero	1	$0.1M		Detection limit
Cluster	10	1		Best reasonable intervention point
Outbreak	1,000	10	MERS-CoV	Containment agility and efficacy required
Epidemic	10,000	100	SARS-CoV-1	Severe economic and health impact
Pandemic	100,000	billions	Cholera, Zika	System overload likely
Global Pandemic	100,000+	trillions	SARS-CoV-2	Societal collapse risk
Global Endemic	10,000+, per year	billions+ per year	Malaria, HIV	Changes humanity
Global Hyperendemic	million+, per year	trillions per year		Threatens humanity
The longer we take to successfully intervene, the larger the costs in lives and economics. This is not a linear relationship.				

We know the threats. BARDA, NIAID, WHO, and many others have sophisticated risk-assessment activities, and prioritized lists of pandemic threats based on their infectivity, associated morbidity and mortality, mode of transmission, incubation time, likely source, etc. Indeed, there are even economic models that project how much fear the public will have (based on symptoms and pathogenesis), and what economic impacts the various levels of societal fear will engender. Each of us can remember SARS-CoV-1. We know the threats, we know what to target, and we can develop mitigations against as many or as few as we decide is reasonable.

There is ample innovation within our university systems. NIAID does an outstanding job of pathogen prioritization, communication to stakeholders, and funding allocation. The $6B allocated results in 2 new patents… every day. This creative juggernaut is focused on applied solutions to societal problems, many directly related to pandemic security. Indeed, after the 2003 outbreak, researchers isolated monoclonal antibodies from SARS-CoV-1 *that are very likely effective against SARS-CoV-2*. These could easily have been developed into effective medicines using industry-standard processes. They never were, however, because the paradigm is wrong and must be changed.

There is no commercial market for diseases without incidence. Don't fabricate a market, *change the paradigm*. The standard pharma industry model is not functional for infectious diseases—especially sporadic ones. We must stop hoping that standard commercial incentives will result in pandemic threat mitigations. We have highly functioning sources of investment for research and development. We have incentivized some repurposing of already approved drugs. But we have failed to create circumstances within which companies compete to develop innovative, purpose-built medicines for pandemic security. Let's change the paradigm.

Solution

Enable the best of the public and private sectors to together secure our nation in preparation for the next pandemics. A U.S. government-backed, onshore, public-private partnership could identify, vet, develop, and manufacture medicines faster, better, and for less cost than any other option of which we're aware. Entrepreneurial, agile, adaptable, data-driven leadership, with a mission to develop novel diagnostics, vaccines, prophylactics, and therapeutics in preparation for pandemic-scale threats would enable the best of the public and private sectors to together secure our nation in preparation for the next pandemics.

Clear the bottleneck. We understand the threats. We understand the structural problem. Our academic research partners are creative and productive. We know we must act today if we are to avoid the next COVID. Celdara's unique translational research model and academic network is *ideal* to fill the innovative medicines gap. A prudent investment this year would significantly improve our pandemic security.

Use a new model, with a proven track record. Large, bureaucratic organizations are culturally antithetical to the translation of innovations into medicine. Success requires agility, adaptability, and entrepreneurial acumen. Many of the past's attempted solutions to these problems were housed within large, complex, and inflexible organizations. An entrepreneurial, distributed, and purpose-built collaborative with a singular mission is most likely to succeed. While more than one structure can succeed, we propose an agile "**Executive Venture**" model, combining the strengths of operating biotech

firms ("executive") with the strengths of professional venture investors ("venture"). "Executive" is important because of its focus on ownership, operations, and getting stuff done. It is about executing to a budget and a timeline, and allocating resources to be maximally impactful. "Venture" is important because of its focus on pipeline, portfolio, and risk management. It is about supporting new-to-world innovation, collaborating with leaders in many disciplines, and unwavering meritocracy. Together, Executive Venture enables beneficial network effects, lean processes, and rigorously objective decision-making. Programs progress as long as the data continues to be positive, and no longer. Resource allocation is optimized: agile and lagless. At Celdara Medical, our pipeline consists of hundreds of medical discoveries and inventions each year, sourced largely from US universities. We have structured and rigorous due diligence processes, proven development expertise, an agile, entrepreneurial, and operations-focused culture. We have strong relationships with the myriad CROs, CMOs, regulatory experts, government officials, biotech, pharma, and device developers that provide the envisioned public-private partnership both power and adaptability. We have begun to organize these groups, and have been met with unanimous and enthusiastic support for this model.

We believe this partnership would be best programmatically housed with the Department of Health and Human Services, given the complementarity with the mission of BARDA, and our strong history of work with NIH and NIAID. However, we at Celdara stand by ready to work with the Committee and the administration to explore any avenue to help this partnership take form.

HELP Committee Recommendations

We include here our responses to the Committee's recommendations in the first bucket: Tests, Treatments, and Vaccines – Accelerated Research and Development.

1.1: We endorse the Committee's recommendation of the use of **public-private models for supporting domestic manufacturing of vaccines.** This is an issue of national security. While domestic manufacturing capacity will be critical for producing the vaccines this country needs to weather the COVID-19 pandemic, it is also critical to support U.S. researchers working on solutions for the next pandemic. We are glad to see this Committee endorse a public-private model to solve the public health crisis at hand, and we look forward to working with the Committee to demonstrate how a related model could also address future pandemic security.

1.2: **Congress must continue support for the NIH research and partnerships with academic institutions**. Furthermore, a public-private partnership would serve as a supportive and natural "translational" extension of current efforts by the NIH, and U.S. academic and research institutions. By efficiently prioritizing inventions for development, and bringing preclinical and clinical development expertise, regulatory expertise, and manufacturing expertise to bear earlier in the process, both through in-house capabilities and in partnership with leading CROs, CMOs, and integrated biopharmaceutical companies, we can ensure that promising inventions don't die on the vine.

1.3: **HHS and NIH house programs whose continued existence will be critical to meeting the challenge of another pandemic head-on.** The Committee's recommendation for closer coordination between Congress and the administration on implementing the Medical Countermeasure Innovation Partner program is a good start. A public-private partnership

would provide HHS with additional and complementary (executive/operational) structure and sustained collaboration with the private sector and academic institutions.

1.4: **The U.S. was caught flat-footed by this pandemic.** We agree with the Committee that the private sector should be more closely engaged with government to develop early diagnostic tests, and ensure flexibility so those tests can be rapidly developed in a public health emergency. A public-private partnership **would ensure close communication between the critical components of HHS, other elements of the U.S. government, experts at our world-class research institutions, and the private sector** to ensure the U.S. is prepared to meet that challenge.

We look forward to working with the Committee to create an option that complements existing capabilities in the government, leverages the unique resources of our nation's research base, and best stimulates the creativity and genius of the private sector.

At Celdara Medical we have adopted the motto, *Finis Origine Pendet*, "The outcome depends on the beginning." We must begin to secure our nation in preparation for future pandemics so that our next outcomes are worthy to be called a legacy.

Sincerely,

Dr. Jake Reder

CEO, Celdara Medical