

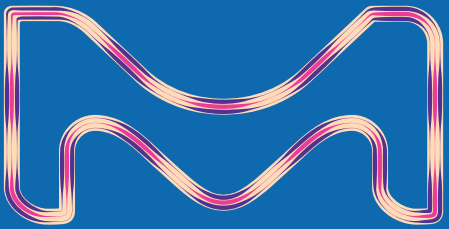
Supply Chain

In Times of

Disruption & Disease

Chris Ross

Head of Integrated Supply Chain Operations
MilliporeSigma



The life science business of Merck KGaA,
Darmstadt, Germany operates as MilliporeSigma
in the U.S. and Canada.

**Millipore
Sigma**



The Life Science tools business
of Merck KGaA, Darmstadt, Germany

70%

Family owned

Healthcare

Performance Materials

Life Science



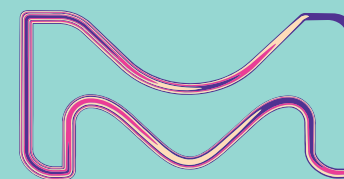
1668
founded



\$7.5 bn
annual
sales



22,000
global
employees



Our sTrenGTH in fighting this pandemic means working together, openly and rapidly, as a GLoBaL Family

Our guiding principles

1

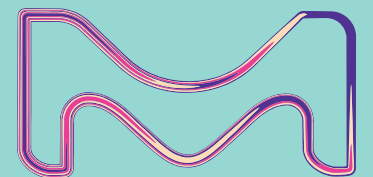
Ensure the safety and well-being of our employees and their families

2

Play a positive role in public health

3

Sustain our business well beyond the crisis



The enGIne BeHInD THE SOLUTION

in times of crisis and beyond

We are dedicated to helping solve the toughest problems and accelerating access to health — that's why we're driven to aid in the response to COVID-19.

Leveraging our key strengths



OUR PEOPLE

22,000+ **employees**
helping to solve the toughest
problems in life science



OUR RESPONSE

Working with the global community
in times of crisis and stability



OUR PRODUCTS

Delivering
150+
essential products



OUR GLOBAL PRESENCE

Supply chain expertise with 100+
distribution points, speeding access for research
and development teams around the world





OUR PeOPLe

22,000+

employees are the backbone of our organization. Their safety and wellbeing remains our top priority; creating a safe workplace ensures our ability to manufacture & distribute solutions driving the COVID-19 response.

SAFETY

We've implemented measures to keep our employees safe while continuing to power the scientific community

- 1 Site de-densification and social distancing
- 2 Additional precautionary personal protective equipment
- 3 Regimented cleaning schedules at all locations

DIGITAL SOLUTIONS

Leveraging technology to collaborate with and support those responding to COVID-19

- 1 Dedicated customer & technical service teams
- 2 Virtual customer meetings
- 3 Expanded webinars and online trainings



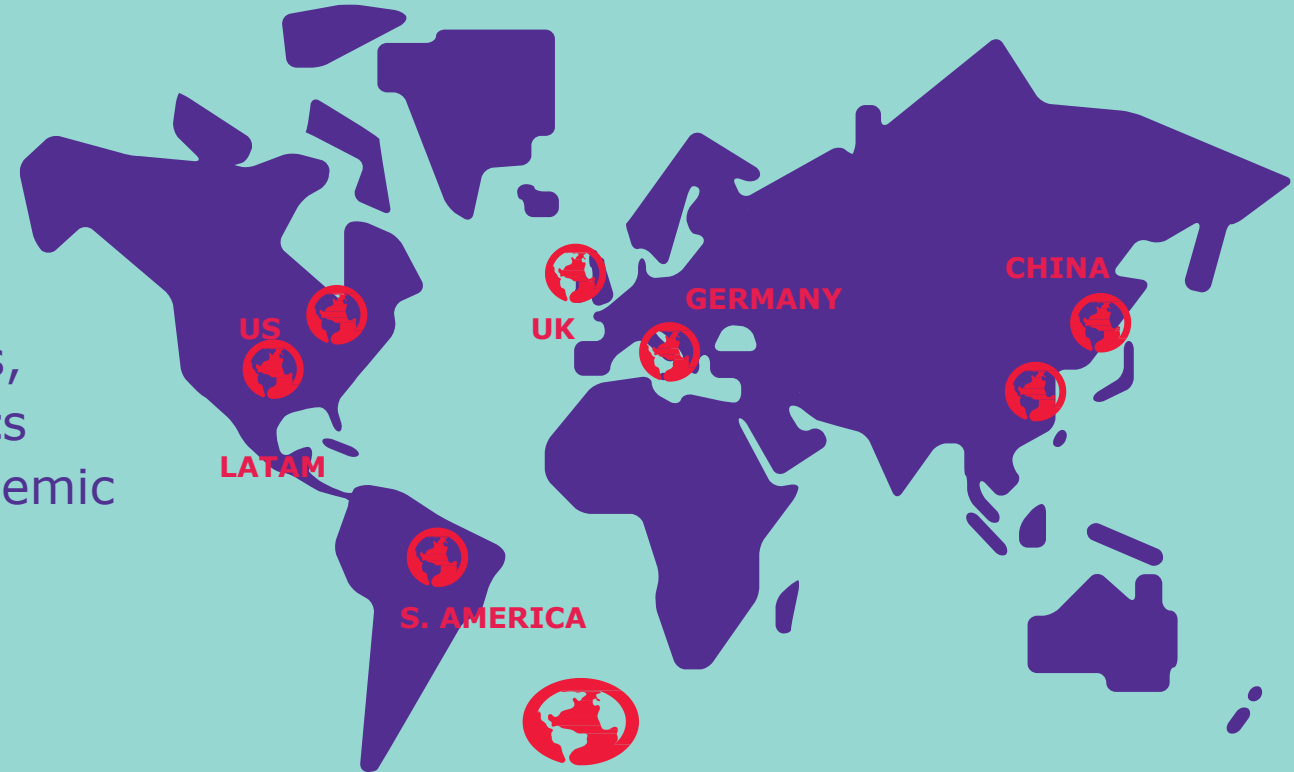
Our RoLe In PUBLIC HeaLTH

We Manufacture & Supply...

Products & raw materials utilized for the research and development of vaccines, diagnostic tests, and potential therapeutics by customers fighting the COVID-19 pandemic

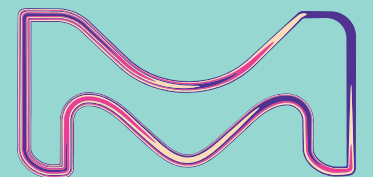
...Serving

- Academic labs
- Biopharmaceutical companies
- Industries like food & beverage companies



~59

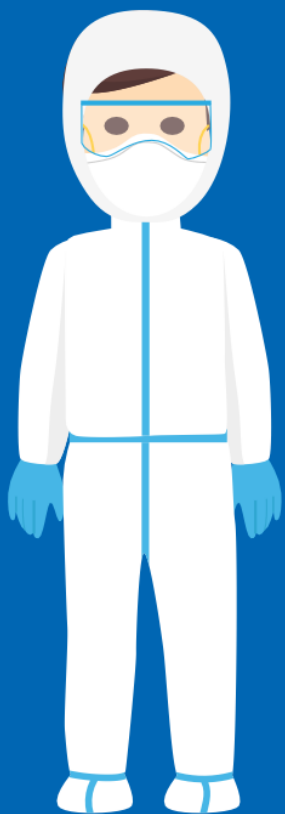
manufacturing
sites





OUR ReSPOnSe

Responsibility is one of our core values, and we're responding in more ways than our products and services.



We're helping solve the toughest problems by supplying key products for COVID-19 response to:

18

MAbs & plasma products

25

Testing Solutions

46

Vaccine programs

4

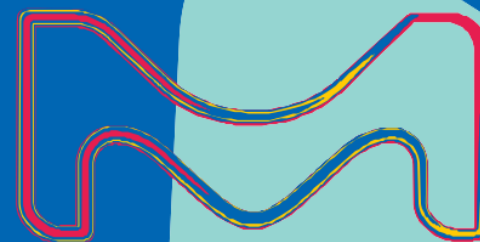
Antiviral programs

We're supporting ongoing efforts with donations beyond our portfolio contributions

- Personal Protective Equipment for medical aid and frontline health care workers
- Products to local institutions and in-vitro diagnostic manufacturers in China

We're virtually connecting students with at-home, hands-on science lessons:

- At-home Curiosity Labs™ experiments
- Supporting expansion of STEM e-learning by our NGO partners





OUR PrODUCTS

Each of these areas will be critical in slowing the progression of COVID-19 and ultimately protecting the world in the future

In the past 30 years
every drug approved by
the US FDA included
our products

VIRUS DETECTION

- **Two** key **diagnostic technologies** emerged **critical** in **COVID-19 response**:
- **RT-PCR** molecular diagnostics involved in the diagnosis of COVID-19:
 - Patient Sample Collection (i.e. guanidine thiocyanate)
 - RNA Extraction (i.e. proteinase K)
 - RNA Amplification/Detection (i.e. oligo primers & fluorescent probes)
- **Serological**: test for presence of antibodies:
 - Lateral flow test strip (i.e. Hi-flow membranes)
 - Detection reagents (i.e. Estapor beads)
 - General Purpose Reagents (i.e. probumin)

VIRUS CHARACTERIZATION

- Effective vaccines and therapies start with reliable virus characterization. We offer one of the largest portfolios of biologic reagents and hardware
- Understanding viral attachment and entry, viral genomics, or viral proteomics requires the highest quality reagents
- Consisting of several platforms that include DNA, Inactivated, Live Attenuated Virus, Viral Vector, Protein Subunit and mRNA

VACCINE & THERAPY PRODUCTION

- Cell Culture Media
- Clarification
- DNA digestion
- Tangential flow filtration,
- Chromatography
- Sterile filtration
- Single-Use

OUR
GLOBaL PreSenCe



OUR
COVID-19
GLOBAL TASKFORCE

is actively monitoring and solving potential disruptions, so our global supply chain continues to meet critical customer needs

- Increasing stock and activating secondary suppliers
 - Dedicated import and export teams to speed the time of receipt and delivery
 - Business continuity plans in place for pandemic scenarios ensuring supply chain security

59 MANUFACTURING
SITES

100+ DISTRIBUTION
CENTERS

Proteinase K (ProK)

Journey

What is ProK?

ProK is an **enzyme used in molecular biology to efficiently isolate native, undamaged DNA & RNA.**

How does it work?


It breaks down proteins and quickly inactivates other enzymes known as nucleases to purify genetic material.

Important
component in
**molecular
diagnostic kits**


Originates from fungus

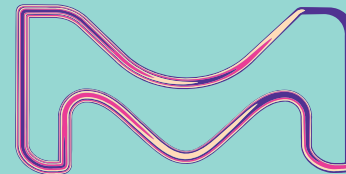
Product of a truly
**global supply
chain**



1 
The raw material for ProK undergoes fermentation then is extracted and purified before lyophilizing (freeze drying) into a powder state at our sites in **Darmstadt, Germany** and **Jerusalem, Israel**.

2 
Some of that final material then remains in Germany and Israel for packaging while the rest is shipped to **Temecula, California** and **St. Louis, Missouri** for packaging into final product.

3 
ProK is **distributed globally** from **Temecula, Milwaukee** and **Schnelldorf, Germany**.



This life science tool is **instrumental to current research on COVID-19 and the pursuit of effective diagnostic for the disease.**



Finished products make multiple crossings of international borders on three continents before reaching the labs where clinical testing occurs. With such global transitions in mind, our success in fighting this pandemic today relies on our ability to share information and move product seamlessly across national borders.

