BIONTECH

J.P. Morgan Healthcare Conference

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Forward-Looking Statements and Disclaimer

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including, but not limited to, statements concerning: BioNTech's expected revenues and net profit related to sales of BioNTech's COVID-19 vaccine, referred to as COMIRNATY® where approved for use under full or conditional marketing authorization, in territories controlled by BioNTech's collaboration partners, particularly for those figures that are derived from preliminary estimates provided by BioNTech's partners; BioNTech's pricing and coverage negotiations with governmental authorities, private health insurers and other third-party payors after BioNTech's initial sales to national governments; the future commercial demand and medical need for initial or booster doses of a COVID-19 vaccine; competition from other COVID-19 vaccines or related to BioNTech's other product candidates, including those with different mechanisms of action and different manufacturing and distribution constraints, on the basis of, among other things, efficacy, cost, convenience of storage and distribution, breadth of approved use, side-effect profile and durability of immune response; the rate and degree of market acceptance of BioNTech's COVID-19 vaccine and, if approved, BioNTech's investigational medicines; the initiation, timing, progress, results, and cost of BioNTech's research and development programs, including those relating to additional formulations of BioNTech's COVID-19 vaccine, and BioNTech's current and future preclinical studies and clinical trials, including statements regarding the timing of initiation and completion of studies or trials and related preparatory work, the period during which the results of the trials will become available and BioNTech's research and development programs; the timing of and BioNTech's ability to obtain and maintain regulatory approval for BioNTech's product candidates; the ability of BioNTech's COVID-19 vaccine to prevent COVID-19 caused by emerging virus variants; BioNTech's and its counterparties' ability to manage and source necessary energy resources; BioNTech's ability to identify research opportunities and discover and develop investigational medicines; the ability and willingness of BioNTech's third-party collaborators to continue research and development activities relating to BioNTech's development candidates and investigational medicines; the impact of the COVID-19 pandemic on BioNTech's development programs, supply chain, collaborators and financial performance; unforeseen safety issues and claims for potential personal injury or death arising from the use of BioNTech's COVID-19 vaccine and other products and product candidates developed or manufactured by BioNTech; BioNTech's ability to progress BioNTech's Malaria, Tuberculosis and HIV programs, including timing for selecting clinical candidates for these programs and the commencement of a clinical trial, as well as any data readouts; the development of sustainable vaccine production and supply solutions on the African continent, including its BioNTainers, and the nature and feasibility of these solutions; BioNTech's estimates of research and development revenues, commercial revenues, cost of sales, research and development expenses, sales and marketing expenses, general and administrative expenses, capital expenditures, income taxes, and shares outstanding; BioNTech's ability and that of BioNTech's collaborators to commercialize and market BioNTech's product candidates, if approved, including BioNTech's COVID-19 vaccine; BioNTech's ability to manage BioNTech's development and expansion; regulatory developments in the United States and foreign countries; BioNTech's ability to effectively scale BioNTech's production capabilities and manufacture BioNTech's products, including BioNTech's target COVID-19 vaccine production levels, and BioNTech's product candidates; and other factors not known to BioNTech at this time. 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These forward-looking statements are based on BioNTech's current expectations and speak only as of the date hereof.

Safety Information

COMIRNATY® ▼(the Pfizer-BioNTech COVID-19 vaccine) has been granted standard marketing authorization (MA) by the European Commission to prevent coronavirus disease 2019 (COVID-19) in people aged 6 months and older. The vaccine is administered as a 2-dose series 3 weeks apart, in people aged 5 years and older, or as a 3-dose series 3 and 8 weeks apart in children aged 6 months to 4 years. Adults and adolescents from the age of 12 are given 30 micrograms per dose; children aged 5 to 11 years are given 10 micrograms per dose; infants and children aged 6 months to 4 years are given 3 microgram per dose. In addition, the MA has been expanded to include a booster dose (third dose) at least 3 months after the second dose in individuals 5 years of age and older. A third primary course dose may be administered at least 28 days after the second dose to people aged 5 years and older with a severely weakened immune system. The European Medicines Agency's (EMA's) Committee for Medicinal Products for Human Use (CHMP) has completed its rigorous evaluation of COMIRNATY, concluding by consensus that sufficiently robust data on the quality, safety and efficacy of the vaccine are now available.

In addition, COMIRNATY has also been granted standard MA for two adapted vaccines: COMIRNATY Original/Omicron BA.1, which contains mRNA encoding for the spike protein of the wild-type and of the Omicron BA.1 subvariant of SARS-CoV-2; and COMIRNATY Original/Omicron BA.4-5, which contains mRNA encoding for the spike protein of the wild-type and of the Omicron BA.4/BA.5 subvariant of SARS-CoV-2. COMIRNATY Original/Omicron BA.1 may be administered as a booster in people aged 12 years and older and COMIRNATY Original/Omicron BA.4-5 may be administered as a booster in people aged 5 years and older who have received at least a primary vaccination course against COVID-19. There should be an interval of at least 3 months between administration of COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 and the last prior dose of a COVID-19 vaccine.

IMPORTANT SAFETY INFORMATION:

- Events of anaphylaxis have been reported. Appropriate medical treatment and supervision should always be readily available in case of an anaphylactic reaction following the administration of the vaccine. Close observation for at least 15 minutes is recommended following vaccination. No further dose of the vaccine should be given to those who have experienced anaphylaxis after a prior dose of Comirnaty.
- There is an increased, but very rare risk (<1/10,000 cases) of myocarditis and pericarditis following vaccination with COMIRNATY. These conditions can develop within just a few days after vaccination and have primarily occurred within 14 days. They have been observed more often after the second vaccination, and more often in younger males. Available data suggest that the course of myocarditis and pericarditis following vaccination is not different from myocarditis or pericarditis in general.
- Rare cases of acute peripheral facial paralysis; uncommon incidence of insomnia, hyperhidrosis and night sweats; and unknown incidence of paraesthesia, hypoaesthesia and erythema multiforme have been identified in post-marketing experience.
- Anxiety-related reactions, including vasovagal reactions (syncope), hyperventilation or stress-related reactions (e. g. dizziness, palpitations, increases in heart rate, alterations in blood pressure, tingling sensations and sweating) may occur in association with the vaccination process itself. Stress-related reactions are temporary and resolve on their own. Individuals should be advised to bring symptoms to the attention of the vaccination provider for evaluation. It is important that precautions are in place to avoid injury from fainting.
- Vaccination should be postponed in individuals suffering from acute severe febrile illness or acute infection. The presence of a minor infection and/or low-grade fever should not delay vaccination.
- As with other intramuscular injections, the vaccine should be given with caution in individuals receiving anticoagulant therapy or those with thrombocytopenia or any coagulation disorder (such as haemophilia) because bleeding or bruising may occur following an intramuscular administration in these individuals.
- The efficacy, safety and immunogenicity of the vaccine has not been assessed in immunocompromised individuals, including those receiving immunosuppressant therapy. The efficacy of COMIRNATY, COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 may be lower in immunosuppressed individuals.
- As with any vaccine, vaccination with COMIRNATY, COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 may not protect all vaccine recipients. Individuals may not be fully protected until 7 days after their second dose of the vaccine.
- Adverse reactions observed during clinical studies are listed below according to the following frequency categories: Very common (≥ 1/10), Common (≥ 1/100 to < 1/10), Uncommon (≥ 1/1,000 to < 1/100), Rare (≥ 1/10,000 to < 1/1,000), Very rare (< 1/10,000), Not known.
- Very common side effects: injection site pain, injection site swelling, tiredness, headache, muscle pain, chills, joint pain, diarrhea, fever
- Common side effects: injection site redness, nausea, vomiting
- Uncommon side effects: enlarged lymph nodes (more frequently observed after the booster dose), feeling unwell, arm pain, insomnia, injection site itching, allergic reactions such as rash or itching, feeling weak or lack of energy/sleepy, decreased appetite, excessive sweating, night sweats
- Rare side effects: temporary one-sided facial drooping, allergic reactions such as hives or swelling of the face
- Very rare side effects: inflammation of the heart muscle (myocarditis) or inflammation of the lining outside the heart (pericarditis), which can result in breathlessness, palpitations or chest pain,
- Not known side effects (cannot be estimated): anaphylaxis, extensive swelling of vaccinated limbs; facial swelling, pins and needles/tingling, reduced sense of touch or sensation, a skin reaction that causes red spots or patches on the skin, heavy menstrual bleeding.
- A large amount of observational data from pregnant women vaccinated with the initially approved COMIRNATY vaccine during the second and third trimester have not shown an increase in adverse pregnancy outcomes. While data on pregnancy outcomes following vaccination during the first trimester are presently limited, no increased risk for miscarriage has been seen. COMIRNATY can be used during pregnancy. No effects on the breast-fed newborn/infant are anticipated since the systemic exposure of breast-feeding woman to the initially approved COMIRNATY vaccine is negligible. Observational data from women who were breast-feeding after vaccination have not shown a risk for adverse effects in breast-fed newborns/infants. COMIRNATY can be used during breast-feeding.
- No data are available yet regarding the use of COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 during pregnancy. Since differences between products are confined to the spike protein sequence, and there are no clinically meaningful differences in reactogenicity between those COMIRNATY variant adapted vaccines that have been clinically evaluated, COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 can be used during pregnancy.
- No data are available yet regarding the use of COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 during breast-feeding. Observational data from women who were breast-feeding after vaccination with the initially approved COMIRNATY vaccine have not shown a risk for adverse effects in breast-fed newborns/infants. COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 can be used during breast-feeding
- Interactions with other medicinal products or concomitant administration of COMIRNATY, COMIRNATY Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 with other vaccines has not been studied.
- Animal studies with COMIRNATY Original do not indicate direct or indirect harmful effects with respect to reproductive toxicity.
- The safety of a COMIRNATY Original/Omicron BA.1 booster dose in individuals from 18 to ≤ 55 years of age is extrapolated from safety data from a subset of 315 adults 18 to ≤ 55 years of age who received a booster (fourth dose) of Omicron BA.1 30 µg (monovalent) after completing 3 doses of COMIRNATY. The most frequent adverse reactions in these participants 18 to ≤ 55 years of age were injection site pain (> 70%), fatigue (> 60%), headache (> 40%), myalgia (> 30%), chills (> 30%) and arthralgia (> 20%).
- In a subset from the Phase 3 study, 305 adults > 55 years of age who had completed 3 doses of COMIRNATY, received a booster of COMIRNATY Original/Omicron BA.1 after receiving Dose 3. The overall safety profile for the COMIRNATY Original/Omicron BA.1 booster (fourth dose) was similar to that seen after the COMIRNATY booster (third dose). The most frequent adverse reactions in participants greater than 55 years of age were injection site pain (> 50%), fatigue (> 40%), headache (> 30%), myalgia (> 20%), chills and arthralgia (> 10%). No new adverse reactions were identified for COMIRNATY Original/Omicron BA.1.
- The safety of a booster dose of COMIRNATY Original/Omicron BA.4-5 is inferred from safety data for a booster dose of COMIRNATY Original/Omicron BA.1, as well as for a booster dose of COMIRNATY Original in individuals 18 years of age and older, as well as for a booster dose of the initially approved Comirnaty vaccine in individuals 5 years of age and older. The safety and efficacy of Comirnaty Original/Omicron BA.1 and Comirnaty Original/Omicron BA.4-5 in children aged less than 12 years of age have not yet been established. No data are available.
- The duration of protection afforded by the vaccine is unknown as it is still being determined by ongoing clinical trials. As with any vaccine, vaccination with Comirnaty Original/Omicron BA.1 or COMIRNATY Original/Omicron BA.4-5 may not protect all vaccine recipients
- The safety and efficacy of Comirnaty in infants aged less than 6 months have not yet been established.
- For complete information on the safety of COMIRNATY, COMIRNATY Original/Omicron BA.1 and COMIRNATY Original/Omicron BA.4-5, always make reference to the approved Summary of Product Characteristics and Package Leaflet available in all the languages of the European Union on the EMA website.

The black equilateral triangle ▼ denotes that additional monitoring is required to capture any adverse reactions. This will allow quick identification of new safety information. Individuals can help by reporting any side effects they may get. Side effects can be reported to EudraVigilance or directly to BioNTech using email medinfo@biontech.de, telephone +49 6131 9084 0, or via the website www.biontech.de

Safety Information

AUTHORIZED USE IN THE U.S.
Pfizer-BioNTech COVID-19 Vaccine, Bivalent (Original And Omicron BA.4/BA.5)
- Pfizer-BioNTech COVID-19 Vaccine, Bivalent (Original and Omicron BA.4/BA.5) is FDA-authorized under Emergency Use Authorization (EUA) for use in individuals 5 years of age and older as a single booster dose administered at least 2 months after either:
  - completion of primary vaccination with any authorized or approved monovalent* COVID-19 vaccine; or
  - receipt of the most recent booster dose with any authorized or approved monovalent COVID-19 vaccine.

*Monovalent refers to any authorized and approved COVID-19 vaccine that contains or encodes the spike protein of only the Original SARS-CoV-2 virus

COMIRNATY® (COVID-19 Vaccine, mRNA)
- COMIRNATY® (COVID-19 Vaccine, mRNA) is an FDA-approved COVID-19 vaccine for active immunization to prevent coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in individuals 12 yrs of age and older. It is also authorized as a third primary series dose to individuals 12 years of age and older who have certain kinds of immunocompromise
- The COVID-19 vaccine is FDA authorized under Emergency Use Authorization (EUA) for use in individuals 6 months and older to provide:
  - a 3-dose primary series to individuals 6 months through 4 years of age
  - a 2-dose primary series to individuals 5 years and older
  - a third primary series dose to individuals 5 years and older with certain kinds of immunocompromise

EMERGENCY USE AUTHORIZATION
Emergency uses of the vaccines have not been approved or licensed by FDA but have been authorized by FDA under an Emergency Use Authorization (EUA) to prevent Coronavirus Disease 2019 (COVID-19) in individuals aged 6 months and older for the Pfizer-BioNTech COVID-19 Vaccine and 5 years and older for the Pfizer-BioNTech COVID-19 Vaccine, Bivalent. The emergency uses are only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of the medical product under Section 564(b)(1) of the FD&C Act unless the declaration is terminated or authorization revoked sooner.

IMPORTANT SAFETY INFORMATION
Pfizer-BioNTech COVID-19 Vaccine, Bivalent (Original and Omicron BA.4/BA.5), COMIRNATY® (COVID-19 Vaccine, mRNA) and Pfizer-BioNTech COVID-19 Vaccine
- Individuals should tell the vaccination provider about all of their medical conditions, including if they:
  - have any allergies
  - have had myocarditis (inflammation of the heart muscle) or pericarditis (inflammation of the lining outside the heart)
  - have a fever
  - have a bleeding disorder or are on a blood thinner
  - are immunocompromised or are on a medicine that affects the immune system
  - are pregnant, plan to become pregnant, or are breastfeeding
  - have received another COVID-19 vaccine
  - have ever fainted in association with an injection

- Individuals should not get COMIRNATY (COVID-19 Vaccine, mRNA), the Pfizer-BioNTech COVID-19 Vaccine, or the Pfizer-BioNTech COVID-19 Vaccine, Bivalent if they have had a severe allergic reaction after a previous dose of COMIRNATY or the Pfizer-BioNTech COVID-19 Vaccine or any ingredient in these vaccines
- There is a remote chance that these vaccines could cause a severe allergic reaction. A severe allergic reaction would usually occur within a few minutes to 1 hour after getting a dose of the vaccine. For this reason, your vaccination provider may ask you to stay at the place where you received the vaccine for monitoring after vaccination. If you experience a severe allergic reaction, call 9-1-1 or go to the nearest hospital

The vaccine may not protect everyone. Side effects reported with the vaccine include:
- Severe allergic reactions; Non-severe allergic reactions such as rash, itching, hives, or swelling of the face; Myocarditis (inflammation of the heart muscle); Pericarditis (inflammation of the lining outside the heart); Injection site pain; Tiredness; Headache; Muscle pain; Chills; Joint pain; Fever; Injection site swelling; Injection site redness; Nausea; Feeling unwell; Swollen lymph nodes (lymphadenopathy); Decreased appetite; Diarrhea; Vomiting; Arm pain; Fainting in association with injection of the vaccine; Unusual and persistent irritability; Unusual and persistent poor feeding; Unusual and persistent fatigue or lack of energy; Unusual and persistent cool, pale skin
- Individuals should seek medical attention right away if they have any of the following symptoms: difficulty breathing, swelling of the face and throat, a fast heartbeat, a bad rash all over the body, dizziness, and weakness
- Myocarditis (inflammation of the heart muscle) and pericarditis (inflammation of the lining outside the heart) have occurred in some people who have received COMIRNATY® (COVID-19 vaccine, mRNA) or Pfizer-BioNTech COVID-19 Vaccine. The observed risk is higher among adolescent males and adult males under 40 years of age than among females and older males, and the observed risk is highest in males 12 through 17 years of age. In most of these people, symptoms began within a few days following receipt of the second dose of vaccine. The chance of having this occur is very low
- These may not be all the possible side effects of the vaccine. Call the vaccination provider or healthcare provider about bothersome side effects or side effects that do not go away.

Individuals should always ask their healthcare providers for medical advice about adverse events. Report vaccine side effects to the US Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC) Vaccine Adverse Event Reporting System (VAERS). The VAERS toll-free number is 1-800-822-7967 or report online to www.vaers.hhs.gov/reportevent.html. In addition, individuals can report side effects to Pfizer Inc. at www.pfizersafetyreporting.com or by calling 1-800-438-1985

Our Vision

Harnessing the power of the immune system to fight human diseases

BIONTECH

2022 Highlights

Translating Vision into Strong Performance

Commercial & Market Leadership with COVID-19 Franchise[1]

Scientific & Clinical Execution

Corporate Execution

[1] Partnered with Pfizer

2022 Highlights

Translating Vision into Strong Performance

Commercial & Market Leadership with COVID-19 Franchise[1]

~550 million doses
of variant-adapted vaccine[2] shipped

~2 billion doses
invoiced in 2022

>60%
market share[3]

Broadest label
amongst COVID-19 vaccines

[1] Partnered with Pfizer
[2] As of Dec. 16, 2022
[3] Pfizer/BioNTech cumulative global COVID-19 market share across reporting countries; CDC, ECDC OWID data as of Nov 2022

2022 Highlights

Translating Vision into Strong Performance

Scientific & Clinical Execution

[1] Partnered with Genmab
[2] Partnered with Pfizer
[3] Partnered with University of Pennsylvania

Immuno-oncology

Clinical POC across multiple modalities:

- BNT211 **first cell therapy** for solid tumors
- BNT312[1] next-gen **checkpoint immunomodulator**

4 new programs first in human:

- BNT116 FixVac in NSCLC
- BNT141 Ribomab CLDN18.2
- BNT313 Hexabody CD27[1]
- BNT142 Ribomab CD3xCLDN6

Infectious Disease

Initiated
3 COVID-19 vaccine trials

3 Phase 1 trials for mRNA vaccines,
including new pathogen antigens first-in-human:

- Flu+COVID-19[2]
- HSV2[3]
- Malaria

2022 Highlights

Translating Vision into Strong Performance

Corporate Execution

[1] As of Oct. 15, 2022

Rapid deployment

~2 months from regulator recommendations to **vaccine delivery**

Expanded partnerships

4 new collaborations accessing a variety of technologies

Broadened pipeline

22 programs in **26 ongoing trials**

Grew team

>1,500 new employees

Strong financials

€16.6 bn cash +
€4.1 bn trade receivables[1]

2023 Strategic Priorities

COVID-19 franchise[1]

Sustain leadership in COVID-19
Advance next-gen vaccines

Variant-adapted

T-cell enhancing

Combinations

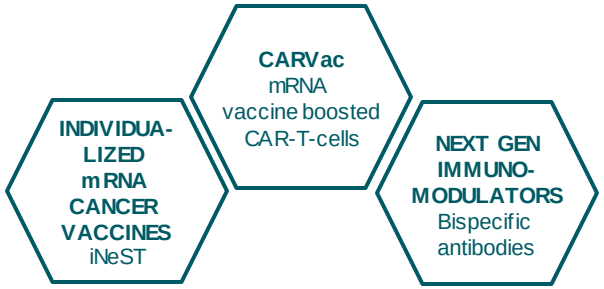
COMIRNATY® COVID-19 mRNA Vaccine

[1] Partnered with Pfizer
[2] Partnered with Genentech
[3] Partnered with Genmab
[4] Out-licensed to Pfizer
[5] Partnered with University of Pennsylvania
[6] Collaboration with BMGF

Immuno-oncology

Advance disruptive platforms for solid tumors

Initiate multiple potentially registrational trials



Most advanced programs:

BNT122[2]	BNT211	BNT311[3]
1L Melanoma & adj. CRC	CLDN6+ tumors	BNT312[3]
		Solid tumors

Infectious diseases

Initiate and accelerate clinical programs for high need indications

Ongoing clinical trials:

Influenza[4]

HSV2[5]

Malaria

Programs advancing to clinic:

Tuberculosis[6]

Shingles[1]

Global Powerhouse Built on People, Presence and Strategic Collaborations

>4,500 professionals globally[1]

>1,500 new hires in 2022

>80 different nationalities

36 average age

>50 % are female

United Kingdom

Health-system-wide collaboration with UK government with the target to deliver up to 10,000 personalized therapies by 2030

Israel

Pandemic preparedness and development of innovative medicines

Taiwan

Clinical trial hub for mRNA-based cancer immunotherapies

Singapore

Commercial-scale mRNA manufacturing

Australia

mRNA research center and clinical manufacturing facility

Rwanda, Senegal, South Africa

Planned mRNA manufacturing facilities

- BioNTech site[2]
- Manufacturing site[2]
- Collaboration
- Memorandum of Understanding for new collaboration

[1] All employment data as of December 2022
[2] Sites may be existing or planned

Focused on Five Innovation Pillars

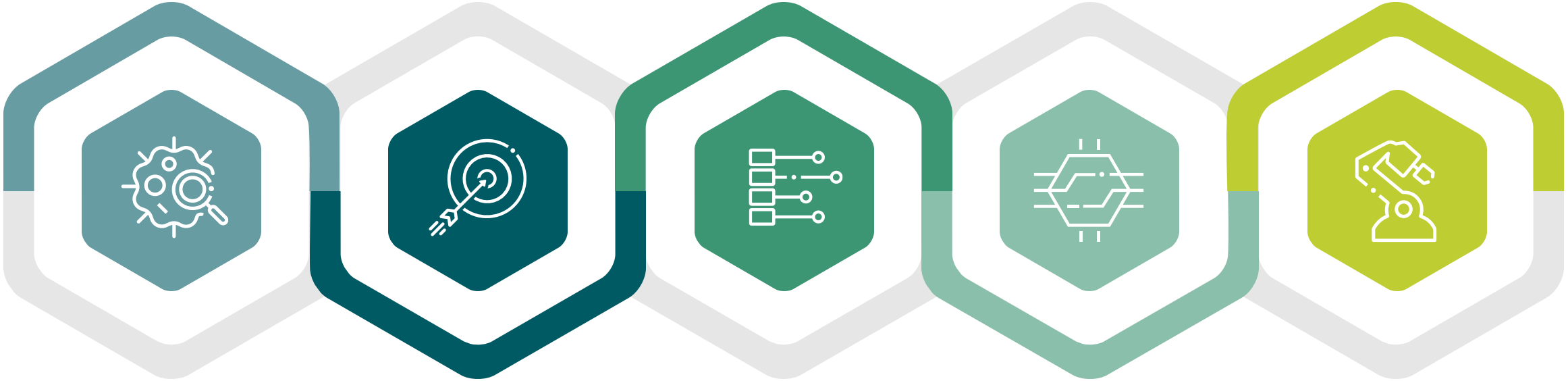
Deep understanding of the immune system

Target discovery and characterization

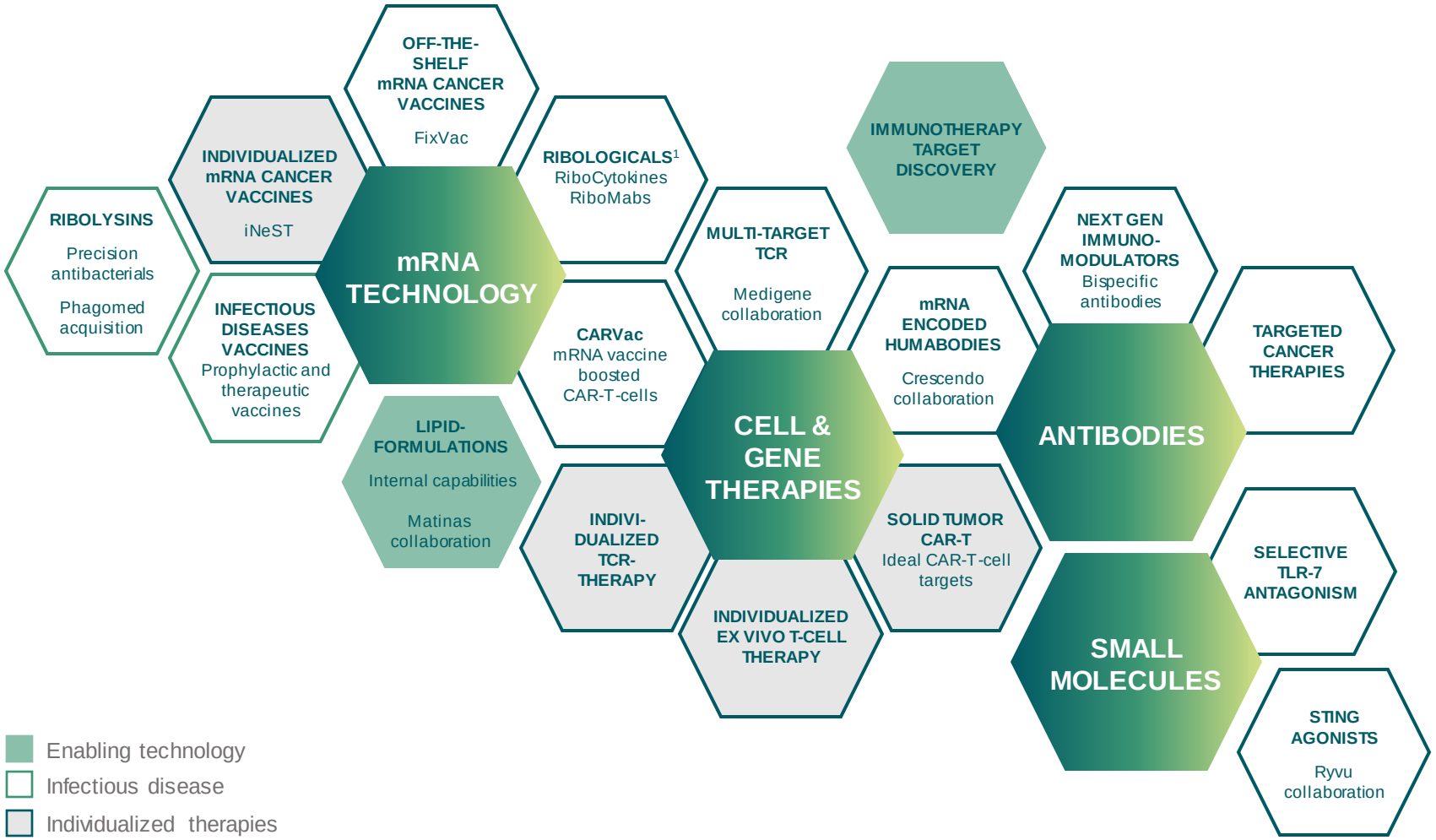
Multi-platform innovation engine

Digital & AI/ML

Manufacturing and automation



Our Disruptive Technology Toolkit to Fight Human Diseases



[1] mRNA encoded cancer-targeting antibodies and cytokines

Core principles of our technology strategy

Technology agnostic approach rooted in deep fundamental understanding of biology

Build novel platforms with the ability to produce multiple product candidates

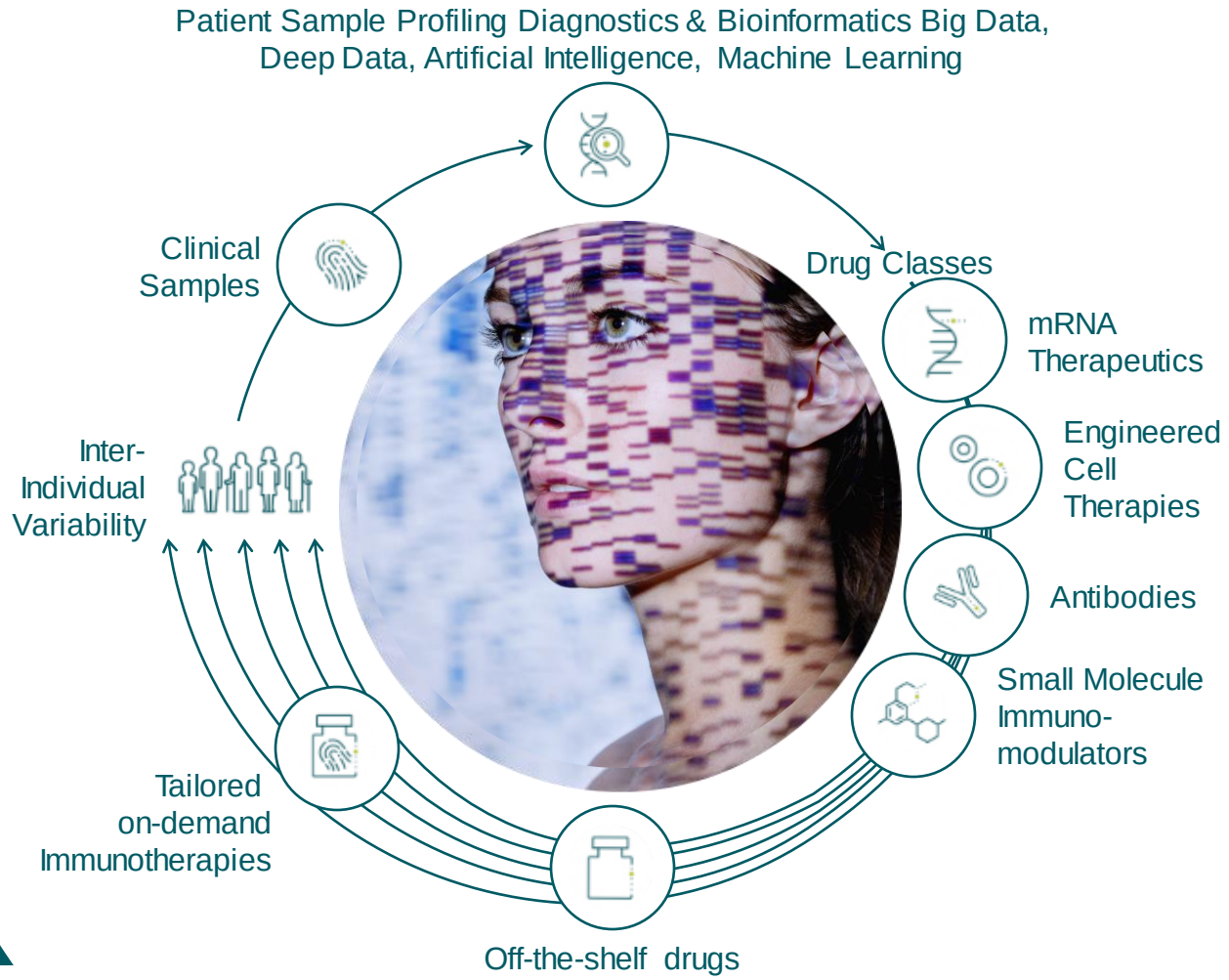
Open up new combination opportunities which leverage synergistic mechanisms of action

Enable individualization of treatment

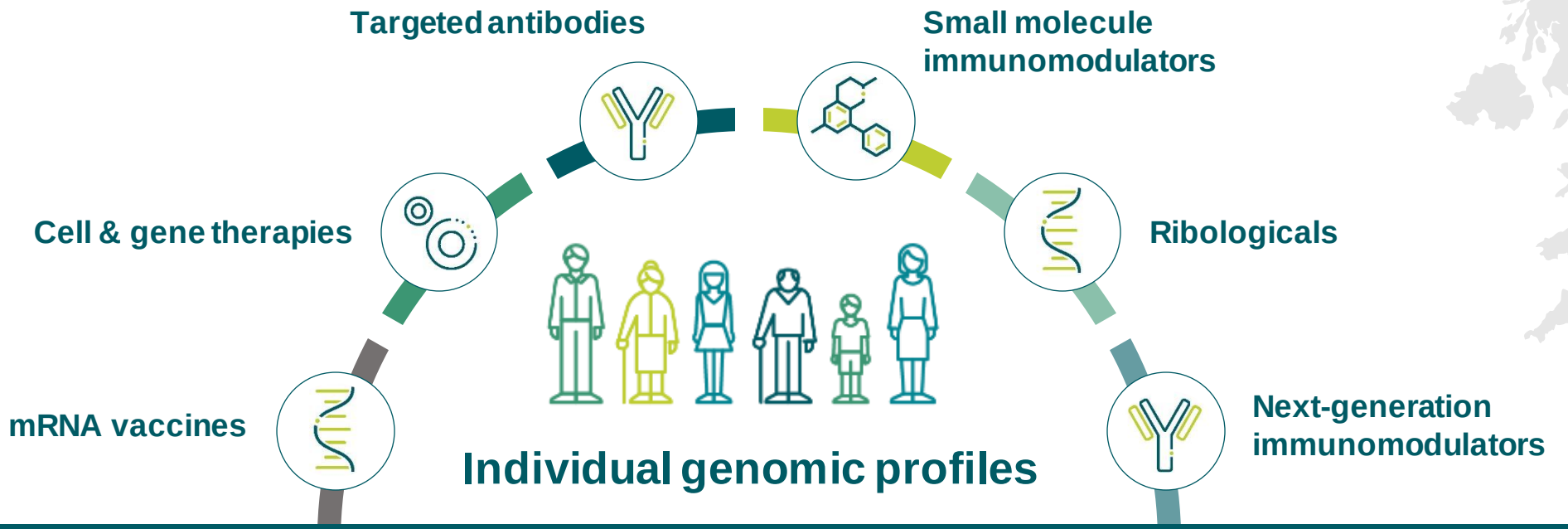
Uniquely Positioned to Individualize Cancer Medicine

Integrated model for immuno-oncology to transform R&D and patient care at scale

- AI & Digitally-integrated target & drug discovery and development
- Individualized treatment platforms to address inter-individual variability
- Deep genomics & immunology expertise to leverage patient data
- Automated manufacturing to serve patients on time and globally



Landmark UK Collaboration to Implement Personalized Medicine: Moving Immune Therapy Development Closer to the Point of Care



Individualized immunotherapy is poised to disrupt cancer care and requires integrated, health-system-wide collaboration	Multi-agency collaboration is a new model for personalized treatment implementation	Patient genomic data informs personalized treatments	Goal for accelerated clinical and regulatory pathways

Goal: 10,000 personalized therapies to reach patients by 2030

BioNTech Innovation is Data and AI Driven

Deep understanding of the immune system: Understanding and exploiting immunological mechanisms through Data Science and ML since early days, including TRON collaboration since 2010

Target discovery and characterization: Exploiting the mutanome for personalized mRNA vaccines. ML drives neoantigen selection and IG prediction algorithms since 2017. Neon Therapeutics acquisition with high quality MS data

Multi-platform innovation engine: Applying AI to support the design of RiboCytokines and RiboMabs. TCR modeling for cell & gene therapies

Digital & AI/ML: Strategic collaboration with **InstaDeep** since 2020. COVID-19 Early Warning System, AI Immune response detection (ELISPOT) and gene synthesis

Manufacturing and automation: Towards a vertically integrated, AI-driven Automated Lab combined with InstaDeep's DeepChain™ protein design platform

Pre-BioNTech: Co-founders' publication documents *in silico* target cloning[1]

GENE

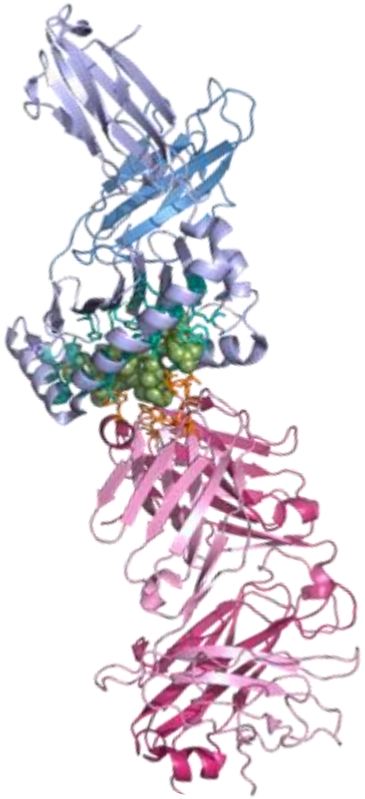
2008

2012

2016

2020

2021+



BioNTech uses AI and ML in all its pillars since its creation in 2008

[1] Helftenbein, Gerd, et al. "In silico strategy for detection of target candidates for antibody therapy of solid tumors." Gene 414.1-2 (2008): 76-84.

InstaDeep, Leader in Artificial Intelligence

Founded in **2014** with **London HQ** and **offices in Cambridge (U.S.), Paris, Tunis, Lagos, Dubai, and Cape Town**

Approx. **240** engineers and tech professionals, including world-class AI & ML researchers. Published in all major ML conferences (**NeurIPS, ICLR, ICML**)

Successful research collaborations with **DeepMind, Google Research, Google Cloud** and **NVIDIA,** plus EMEA ecosystem initiatives

Demonstrated capacity to develop and deploy AI systems at scale in multiple SaaS products (including **DeepChain™**)

Fully owned **Nvidia DGX** supercomputing infrastructure and distributed ML workload management system. **Google Cloud TPU** expertise

On CB Insights' **100 most Innovative AI startups** list for **3 years running**

InstaDeep™

nature machine intelligence

NEURAL INFORMATION PROCESSING SYSTEMS

ICML International Conference On Machine Learning

ICLR

Google Cloud Partner

NVIDIA ELITE PARTNER

AI 100 CBINSIGHTS 2020

AI 100 CBINSIGHTS 2021

AI 100 CBINSIGHTS 2022

InstaDeep is focused on productizing disruptive AI innovation

InstaDeep's Planned Acquisition to Accelerate BioNTech's AI-First Strategy

A fruitful, 3 year collaboration with InstaDeep

Improved neoantigen prediction over current BioNTech model

AI-based computer vision system **improved Immune Response evaluation accuracy and speed**

Improved success rate for AI-driven platform DNA/RNA synthesis together with **40x increase in monthly throughput**

DeepChain™ designed RiboLogicals validated *in vitro*

DeepChain™ designed infectious disease vaccine targets

COVID-19 Early and Future Warning Systems evaluate immune escape from SARS-CoV-2 sequences for improved VOC detection

Transaction Highlights

Upfront cash and BioNTech stock payment of GBP £362 million

Performance-based cash earn-out of up to GBP £200 million within 3 years of transaction close

InstaDeep to become a wholly-owned, London-based BioNTech subsidiary

Closing expected Q1 2023[1]

BIONTECH x InstaDeep™

Our goal is to integrate AI seamlessly into all aspects of our work

[1] Subject to regulatory approvals and other customary closing conditions


COVID-19
Long-term leadership
for our COVID-19 vaccine franchise
BIONTECH

First-to-Market BA.4/5-Adapted Bivalent Vaccine Launch: Scientific and Manufacturing Preparation Leads to Rapid Execution

Omicron-adapted vaccine in ~2 months from regulator recommendation to market

FDA Recommended

Omicron-adapted bivalent vaccine encoding BA.4/5 sublineages

June 30

~2 months

First shipments

COMIRNATY BA.4/5-adapted bivalent vaccine

September 1

Approved in **60+** countries and regions[1]

Broad label covering ages **6 months+ in U.S.**[2] and **5 years+ in EU**[3]

~550 million doses shipped globally[4] **of BA.4/5-adapted** bivalent vaccine

Comprehensive research program and rapid response strategy

Safety database with more than 1.5 billion people treated

Capability to rapidly roll out new vaccines at commercial scale within months

Growing set of commercial relationships and partners around the world

Expanding innovation capabilities in the field of infectious diseases

[1] Including conditional approvals as of December 15, 2022
[2] Pfizer-BioNTech COVID-19 Vaccine is FDA authorized under Emergency Use Authorization (EUA) for active immunization to prevent coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in individuals aged 6 months and older.
[3] COMIRNATY has been granted standard marketing authorization (MA) by the European Commission to prevent coronavirus disease 2019 (COVID-19) in people aged 5 years and older
[4] As of December 16, 2022

COVID-19 Franchise: Being Actionable in the Face of a Dynamic Virus Evolution and Building for Continued Success

COVID-19 a leading cause of death – 250,000+ in the U.S. in 2022[1,2]

Variant-adapted

Address Evolving Virus

Enabled by AI/ML Early Warning System & variant surveillance research

Combinations

Single-Dose Multi-Pathogen Protection

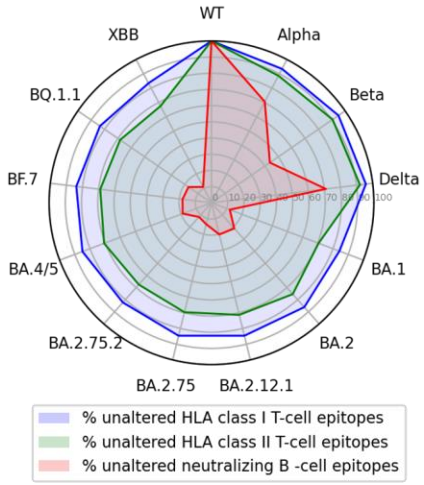
Informed by epidemiology & medical need

T-cell enhancing

Highly-conserved T cell epitopes with broad population-coverage derived from non-spike SARS-CoV2 proteins

- Increase immune resilience
- Enhance and broaden T cell response
- Provide memory T cell persistence
- Enhance B cell response durability

T cell immune response may continue to contribute to prevention or limitation of severe disease



- Progressive loss of conserved B cell epitopes for spike protein neutralizing antibody sites in Omicron sublineages
- Preservation of HLA class I and class II presented T-cell epitopes across the evolution of SARS-CoV-2 spike protein
- T-cell recognition of current Omicron sublineage VoCs may be largely intact

Progressive loss of conserved spike protein neutralizing antibody sites in Omicron sublineages is balanced by preserved T-cell recognition epitopes

Alexander Muik, Bonny Gaby Lui, Huitian Diao, Yunguan Fu, Maren Bacher, Aras Toker, Jessica Grosser, Orkun Ozhelvaci, Katharina Grikscheit, Sebastian Hoehl, Niko Kohmer, Yaniv Lustig, Gili Regev-Yochay, Sandra Ciesek, Karim Beguir, Asaf Poran, Özlem Türeci, Ugur Sahin

CSH Cold Spring Harbor Laboratory

bioRχiv THE PREPRINT SERVER FOR BIOLOGY

Innovation supported by insights from continuous variant surveillance and robust clinical program

[1] https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm
[2] https://covid.cdc.gov/covid-data-tracker/#trends_weeklydeaths_select_00

Infectious Disease

Expanding and accelerating our pipeline

Infectious Diseases: Important Growth Area Addressing High Medical and Global Health Need

Influenza

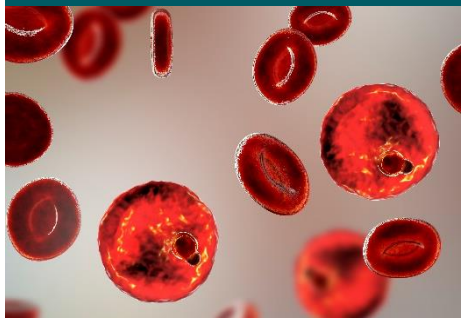
290,000-650,000 deaths
annually on a global scale

HSV2

500 million infected
globally

187 million
suffered episode from herpes-related genital ulcers in 2016

Malaria



~229 million cases
in 2020 across the WHO African Region

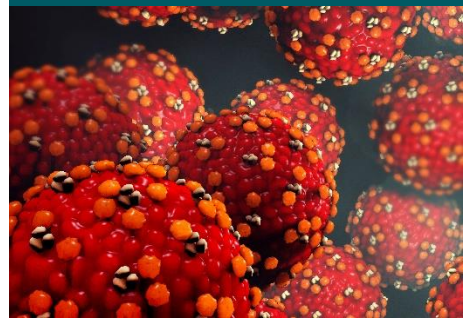
601,000 deaths
in 2020 in the WHO African Region
(80% in children <5 years)

Tuberculosis

10 million cases
globally in 2020

1.5 million deaths
globally in 2020

Shingles



Individuals who live to 85 years old have
~50% risk
of developing shingles

Ongoing clinical programs

- COVID-19 + Influenza
- BNT161: Influenza
- BNT163: HSV-2
- BNT165: Malaria

Planned 2023 trial starts

- BNT164: Tuberculosis
- BNT167: Shingles

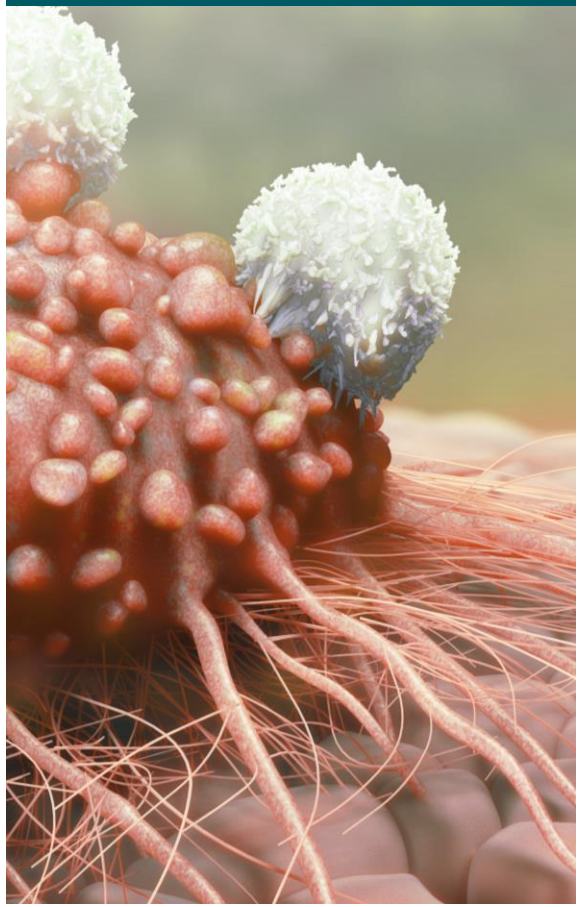
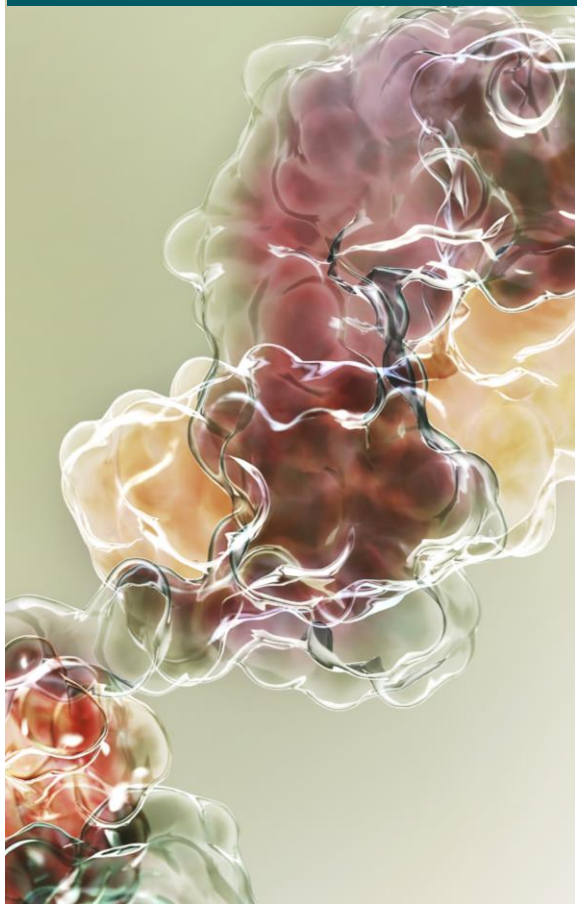
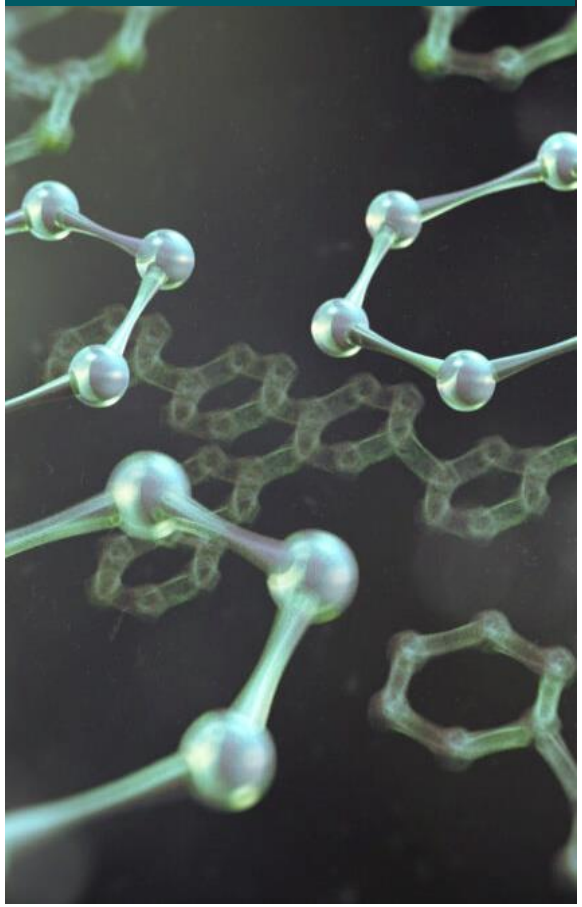
All figures from World Health Organization fact sheets. https://www.who.int/news-room/fact-sheets (accessed June 09, 2022).

Oncology

Accelerating high-priority programs into potentially registrational trials across multiple modalities

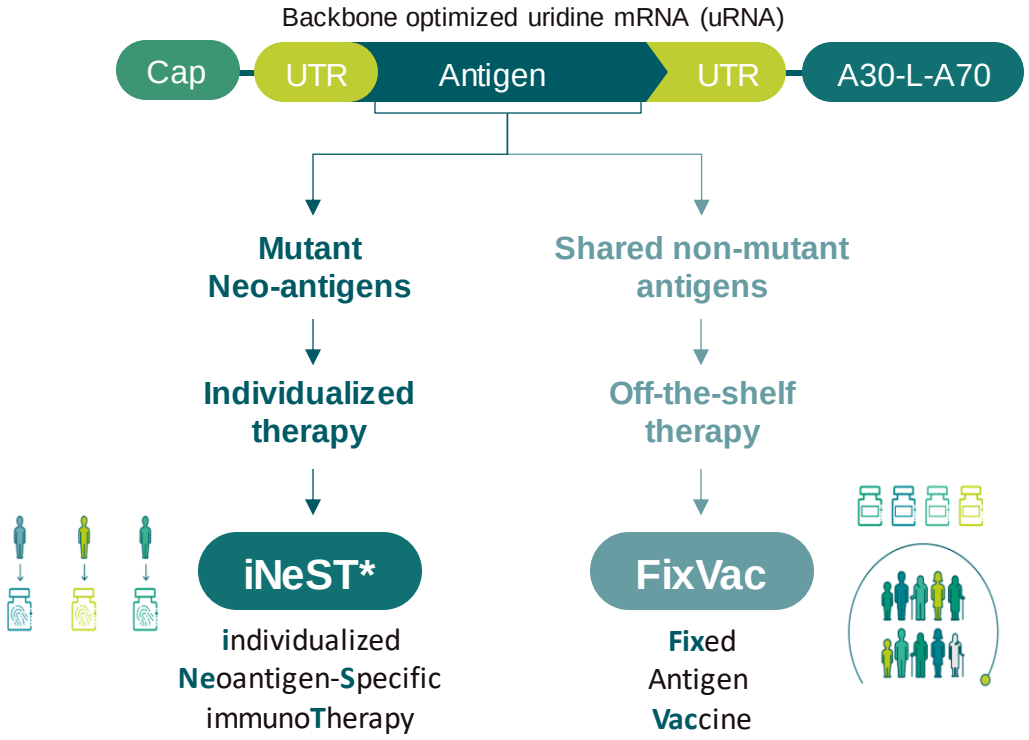
BIONTECH

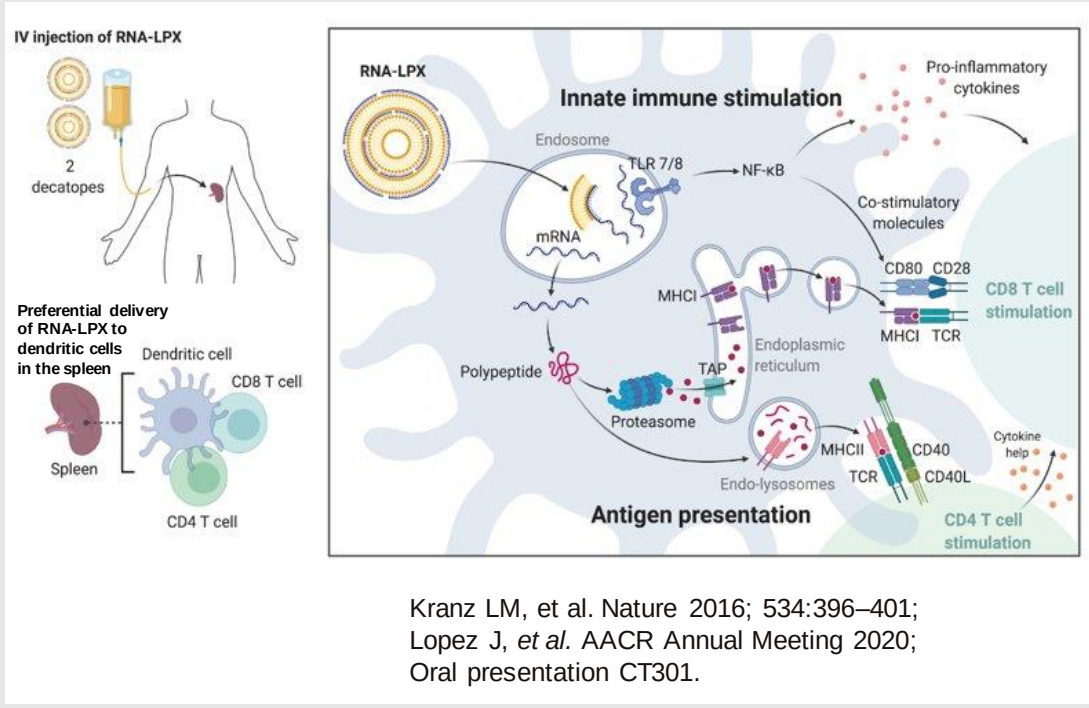
The Tools we Have Developed to Treat Cancer

mRNA technology	Cell and gene therapies	Antibodies	Small molecules
			

19 Clinical Programs in 22 ongoing Clinical Trials

Planned Advancement of mRNA Cancer Vaccines in 2023 Paves the Way to Potentially Registrational Trials





Kranz LM, et al. Nature 2016; 534:396–401;
Lopez J, *et al.* AACR Annual Meeting 2020;
Oral presentation CT301.

Individualized Vaccine

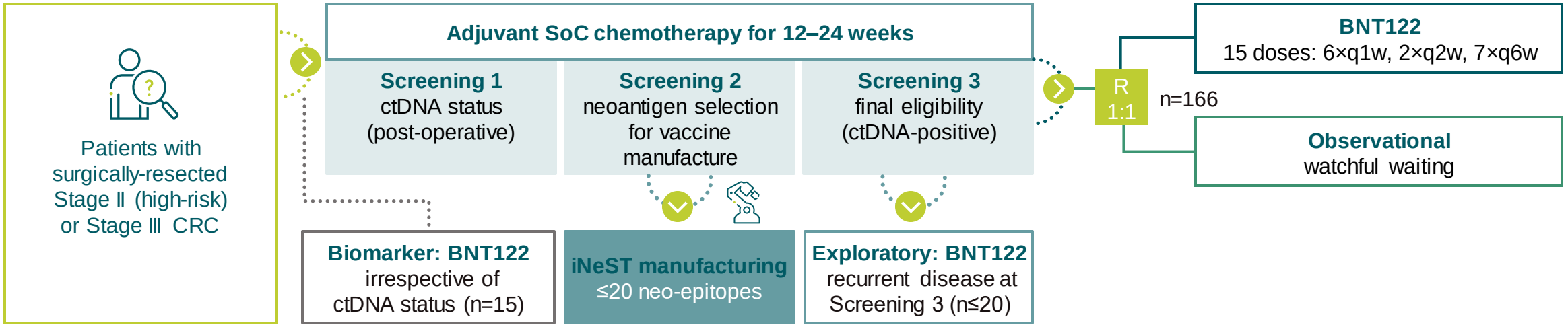
BNT122[1] randomized Phase 2 trials ongoing in 1L melanoma & adjuvant colorectal cancer
BNT122[1] randomized Phase 2 planned in pancreatic cancer based on encouraging Ph 1 data[2]
BNT122[1] Phase 1/ 2 in multiple tumor types completed
IVAC Phase 1 in adjuvant TNBC completed

FixVac

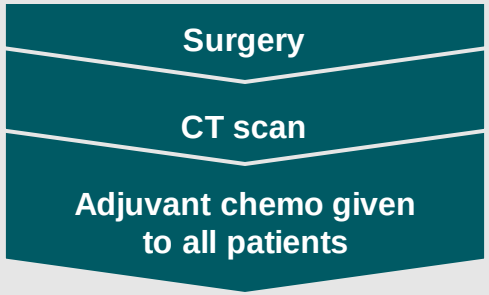
BNT111 randomized Phase 2 ongoing in r/r melanoma
BNT113 randomized Phase 2 ongoing in HPV16+ PD-L1+ 1L HSCC
BNT112 Phase 1 ongoing in localized and metastatic prostate cancer
BNT116 Phase1 ongoing in 1L and 2L+ NSCLC

[1] Collaboration with Genentech.
[2] Balachandran VP, et al. ASCO Annual Meeting 2022; Poster presentation 2516.

iNeST | Autogene Cevumeran (BNT122): Phase 2 Randomized Trial vs Watchful Waiting in Adjuvant Colorectal Cancer



Stage II (high risk) and Stage III colorectal cancer treatment paradigm



50% cured by surgery alone with no residual disease	30% recur despite surgery + chemo	20% cured by adjuvant chemo post-surgery

High medical need in the adjuvant treatment of Stage II (high risk)/Stage III colorectal cancer

Colorectal cancer is second deadliest cancer worldwide[1], 5-year OS in regional disease is 71%[2]

SoC in Stage II (high risk) and Stage III CRC after removal of the primary tumor and adjuvant chemotherapy is watchful waiting

ctDNA is a marker for minimal residual disease and thus can identify patients at high risk of disease recurrence[3,4]

In ctDNA-positive, Stage 2 (high risk) and Stage 3 CRC post adjuvant chemotherapy, duration of disease-free survival is 6 months[5]

[1] WHO factsheet on cancer. 2018
[2] Seer database
[3] Fan G, et al. PLoS One 2017; 12: e0171991
[4] Loupakis F, et al. JCO Precis Oncol 2021; 5:PO.21.00101
[5] Reinert T, et al. JAMA Oncology, 2019; 5:1124−1131.

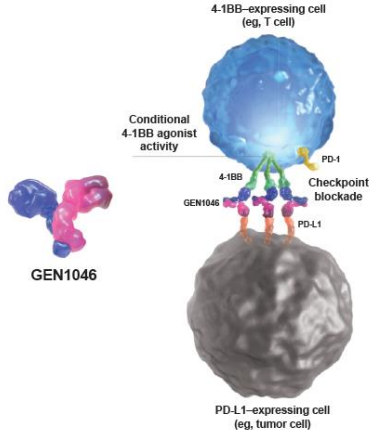
Intercepting Immune-Immune & Immune-Tumor Interactions: Next Generation Checkpoint Immuno-modulators with Pan-Tumor Potential

GEN1046/BNT311[1]

Conditional 4-1BB co-stimulation while blocking PD-(L)1 axis

2 ongoing clinical trials:
Phase 2: BNT311 + Pembro in r/r, 2L+, PD-L1+ NSCLC

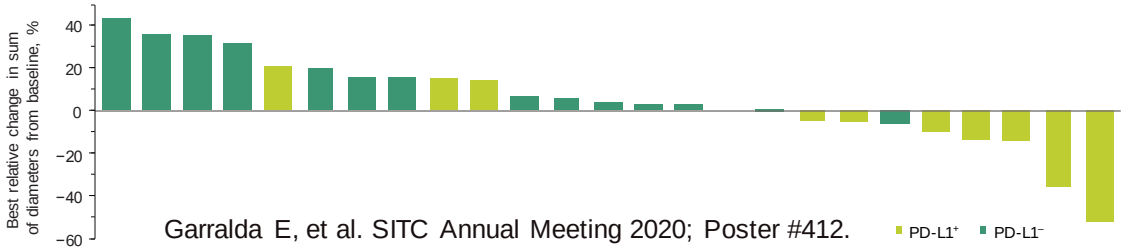
Phase 1/2: BNT311 mono / + PD-(L)1 combination in advanced solid tumors



Expansion cohorts in aPD-(L)1 r/r solid tumors

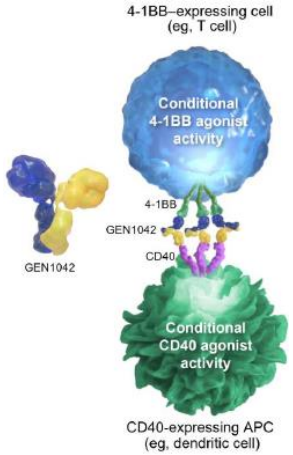
Cervical	TNBC	NSCLC
HNSCC	Endometrial	Urothelial

Initial signs of clinical activity in PD-(L)1 r/r NSCLC (n=25)



Garralda E, et al. SITC Annual Meeting 2020; Poster #412.

GEN1042/BNT312[1]



Conditional activation of CD40 and 4-1BB on immune cells

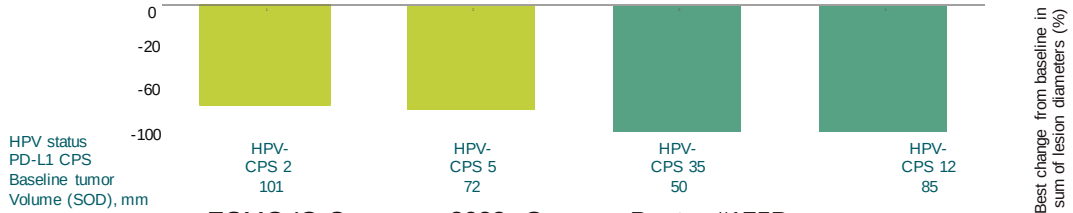
Potential to treat solid tumors in 1L combination with standard-of-care aPD-(L)1 or chemo treatment

Ongoing Phase 1/2 clinical trial in advanced solid tumors

Expansion cohorts in 1L solid tumors

HNSCC	NSCLC
Melanoma	PDAC

PRs and CRs observed in HNSCC patients in combo with pembro + chemo



ESMO IO Congress 2022, Geneva, Poster #175P

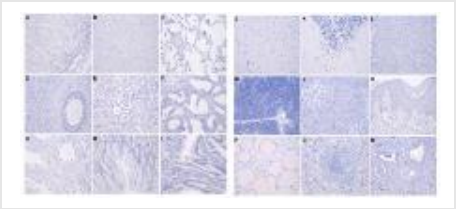
Multiple data updates from ongoing expansion cohorts expected in 2023

[1] Collaboration with Genmab based on 50/50 sharing of costs and profits

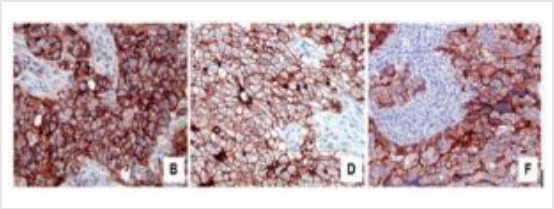
Bringing Cell Therapy to Solid Tumors: Combining the Potential of a Novel Highly Selective Target and a CAR T Cell Amplifying Vaccine

BNT211: Autologous CAR-T +/- CARVac targeting CLDN6+ solid tumors

CLDN6 not present in healthy tissues



CLDN6 expressed in multiple cancers



Science

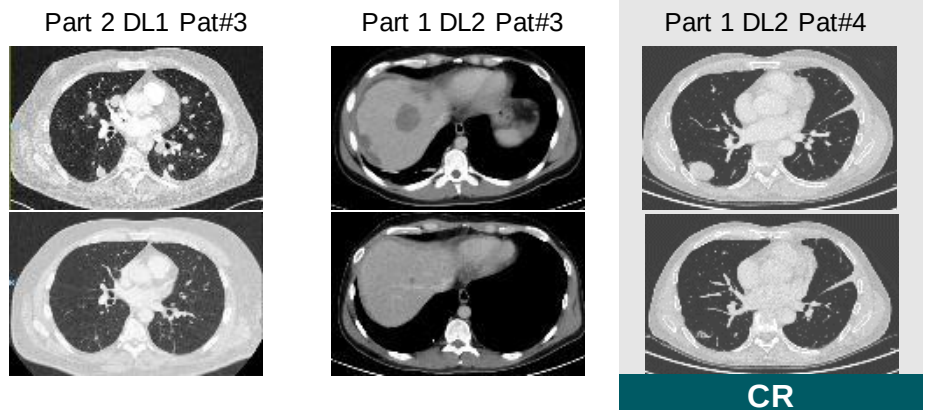
An RNA vaccine drives expansion and efficacy of claudin-CAR-T cells against solid tumors

Reinhard K, *et al. Science* 2020; 367:446–453.

Manageable safety profile and observed clinical activity

- $1x10^7$ and $1x10^8$ CAR-T dose levels well tolerated
- MTD not reached
- Efficacy signal in testicular cancer patients (n=7)
  - **ORR 57%, DCR 85% (1 CR, 3 PR, 2 SD)**
  - **One CR confirmed at 18 and 52 weeks**
- EMA PRIME designation in testicular cancer

Selected scans of responses in various patients



Haanen J, et al. AACR Annual Meeting 2022; Oral presentation CT002.

Additional data readout and Phase 2 trial planned for 2023

CLDN6, claudin 6

Outlook

2023 and beyond

Multiple Late- and Early-stage Pipeline Milestones Expected in 2023

Modality	Indication	Program	Select milestones	Anticipated timing
mRNA vaccines for infectious disease	COVID-19[1]	BA.4/5-adapted bivalent	Pediatric label expansion	2H 2023
	COVID-19 – influenza combination[1]	BA.4/5-adapted bivalent+ BNT161	Phase 1 data update	1H 2023
	Malaria	BNT163	Phase 1 data update	2H 2023
	HSV2[2]	BNT165	Phase 1 data update	2H 2023
	Shingles[1]	BNT167	Phase 1 FPD	1H 2023
	Tuberculosis[3]	BNT164	Phase 1 FPD	Early 2023
iNeST individualized mRNA vaccines	1L melanoma[4]	Autogene Cevumeran (BNT122)	Phase 2 data update	2023
	Adjuvant CRC[4]	Autogene Cevumeran (BNT122)	Phase 2 data update	-
	Adjuvant PDAC[4]	Autogene Cevumeran (BNT122)	Phase 2 FPD	2023
Next-gen immune checkpoint modulators	Multiple solid tumors[5]	BNT311 (PD-L1x4-1BB)	Expansion cohort data update	2023
	Multiple solid tumors[5]	BNT312 (CD40x4-1BB)	Expansion cohort data update	2023
Cell therapies	CLDN6+ solid tumors	BNT211	Phase 1 data update	2023
	2L+ testicular cancer	BNT211	Phase 2 FPD	Late 2023

[1] Partnered with Pfizer
[2] Partnered with University of Pennsylvania
[3] Collaboration with BMGF
[4] Partnered with Genentech
[5] Collaboration with Genmab based on 50/50 sharing of costs and profits
FPD = First Patient Dosed

BIONTECH

Advancing Toward Realizing Our Vision

Driving transformation today

Globally successful marketed COVID-19 vaccine with first-to-market BA.4/5-adapted booster

19 programs in 24 clinical trials

3 Phase 1 programs

5 randomized Phase 2 trials

10+ preclinical programs, 2 FIH trials to start in 2023

Oncology

Infectious diseases

Mid-term goals

Next-gen and combination COVID-19 vaccines

Multiple oncology and ID product launches in next 3–5 years

5–10 IND submissions per year

Long-term vision

Maintain and deepen COVID-19 vaccine leadership

Approved products across various disease areas

Cardiovascular diseases
Neurodegenerative diseases
Autoimmune diseases

By 2030, we aim to be a multi-product global biotechnology leader, aspiring to address the world's most pressing health challenges with pioneering, disruptive technologies delivered at scale

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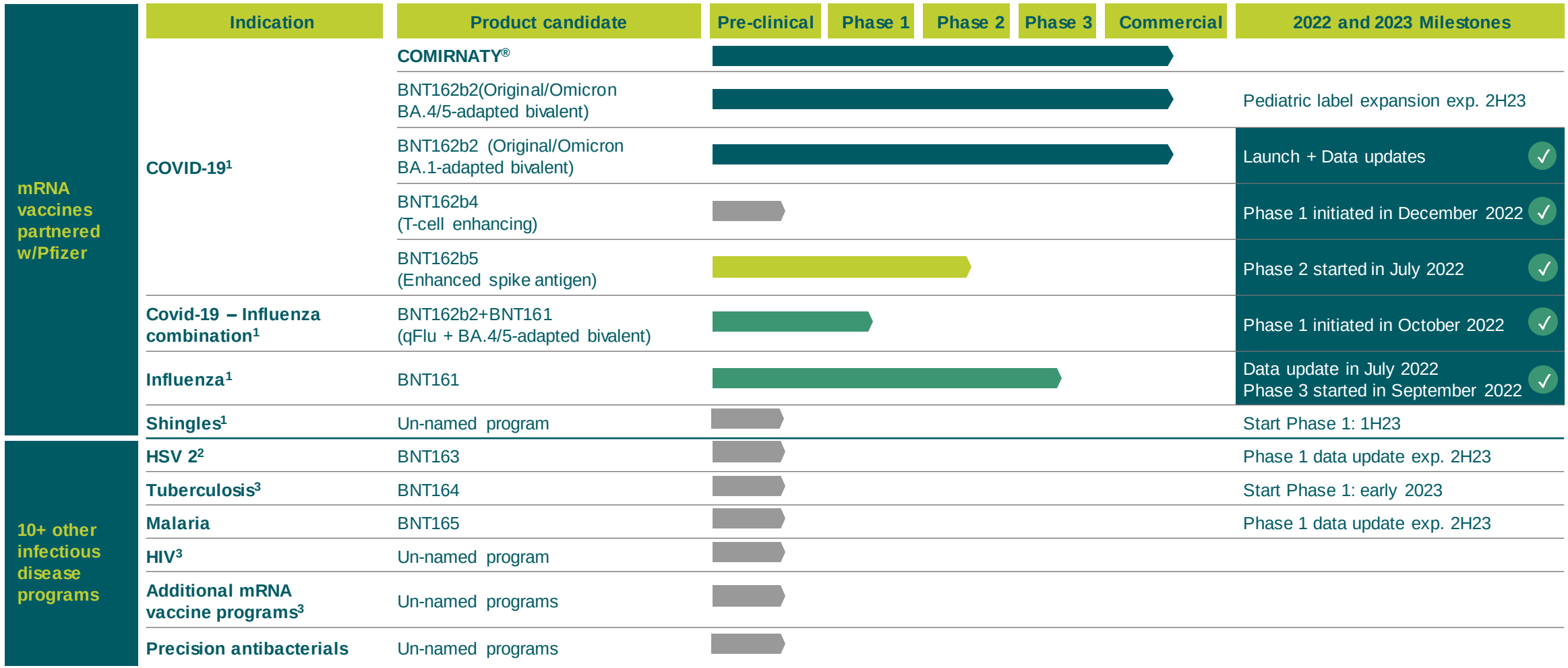
THANK YOU

BIONTECH

Appendix

BIONTECH

Infectious Disease Pipeline: Multiple Opportunities Built on Proven Platform



[1] Partnered with Pfizer
[2] Partnered with University of Pennsylvania
[3] Collaboration with BMGF. BioNTech holds worldwide distribution rights except developing countries where BMGF holds distribution rights.

Oncology Pipeline: Significant Progress and Expansion in 2022

Drug class	Platform	Product candidate	Indication (targets)	Pre-clinical	Phase 1	Phase 2	Phase 3	2022 and 2023 Milestones
mRNA	FixVac	BNT111	Advanced and R/R melanoma					
		BNT112	Prostate cancer					
		BNT113	HPV16+ head and neck cancer					
		BNT116	NSCLC 2L+					FPD in July 2022 ✓
	iNeST	Autogene cevumeran (BNT122)[1]	1L melanoma					Data update exp. 2023
			Adjuvant colorectal cancer					
			Solid tumors					
			Adjuvant pancreatic ductal adenocarcinoma[2]					Start Phase 2 in 2023
	Intratumoral immunotherapy	SAR441000 (BNT131)	Solid tumors (IL-12sc, IL15-sushi, GM-CSF, IFNα)					
	RiboMabs	BNT141	Multiple solid tumors (CLDN18.2)					FPD in Jan. 2022 ✓
		BNT142	Multiple solid tumors (CD3×CLDN6)					FPD in July 2022 ✓
	RiboCytokines	BNT151	Multiple solid tumors (optimized IL-2)					
		BNT152, BNT153	Multiple solid tumors (IL-7, IL-2)					
Cell therapies	CAR T cells + CARVac	BNT211	Multiple solid tumors (CLDN6)					Start Phase 2 in 2023
		BNT212	Pancreatic, other cancers (CLDN18.2)					
	Neoantigen-based T cells	BNT221	Multiple solid tumors					
	TCR engineered T cells	To be selected	All tumors					
Antibodies	Next-gen immune checkpoint modulators	GEN1046 (BNT311)[3]	Metastatic NSCLC (PD-L1×4-1BB)					
			Multiple solid tumors (PD-L1×4-1BB)					Data update exp. in 2023
		GEN1042 (BNT312)[3]	Multiple solid tumors (CD40×4-1BB)					Data update exp. in 2023
		GEN1053 (BNT313)[3]	Malignant solid tumors (CD27)					Initiated in Nov. 2022 ✓
	Targeted cancer antibodies	BNT321	Pancreatic cancer (sLea)					
SMIM	Toll-like receptor binding	BNT411	Solid tumors (TLR7)					

[1] Partnered with Genentech
[2] Investigator-initiated Phase 1 trial
[3] Partnered with Genmab
FPD = First patent dosed, SMIM = small molecule immunomodulators, NSCLC = non-small cell lung cancer