MEDICAL BIOTECHNOLOGY PROFILE AMSTERDAM NOORD-HOLLAND

ROM InWest
INNOVEREN + INVESTEREN

BIOTECH BEDRIJVEN: 200

- Gecentraliseerd in voornamelijk: Amsterdam, Haarlem, Haarlemmermeer
- Belangrijke vestigingslocatie voor big pharma: MSD, Abbott, J&J, Bayer, Boehringer Ingelheim, Teva in totaal 3800 arbeidsplaatsen
- Meer dan 50 MKB bedrijven groter dan 25 medewerkers

KEY COMPETENCES REGIO

1. Excellente kennisbasis in (humane) biotechnologie in termen van wetenschappelijke output en IP
2. Regio waar internationaal talent wil wonen en zich thuis voelt: open cultuur, Engelstalig, goede verbindingen, groen, kindvriendelijke steden.
3. Netwerk: nabijheid EMA, Zorginstituut (tarifering) en internationale aanwezigheid Big Pharma
4. Verbinding Schiphol relevant voor cold-chain (celtherapie, vaccins, organoids) en zakenreizen.

LSH IN NOORD-HOLLAND

Key figures of the Dutch Life Sciences & Health sector

€7bln+
Economic impact

€50bln+
Export value

3,000+
LSH R&D companies

104,000+
Employees

700+
Public-private R&D projects

40+
Strategic public-private partnerships

1,200+
New patents per year

Home to the
European Medicines Agency

and to the
European Patent Office

13
Universities

12
Research universities

4
Specialised in technology and engineering

7
University Medical Centres

26
Campuses

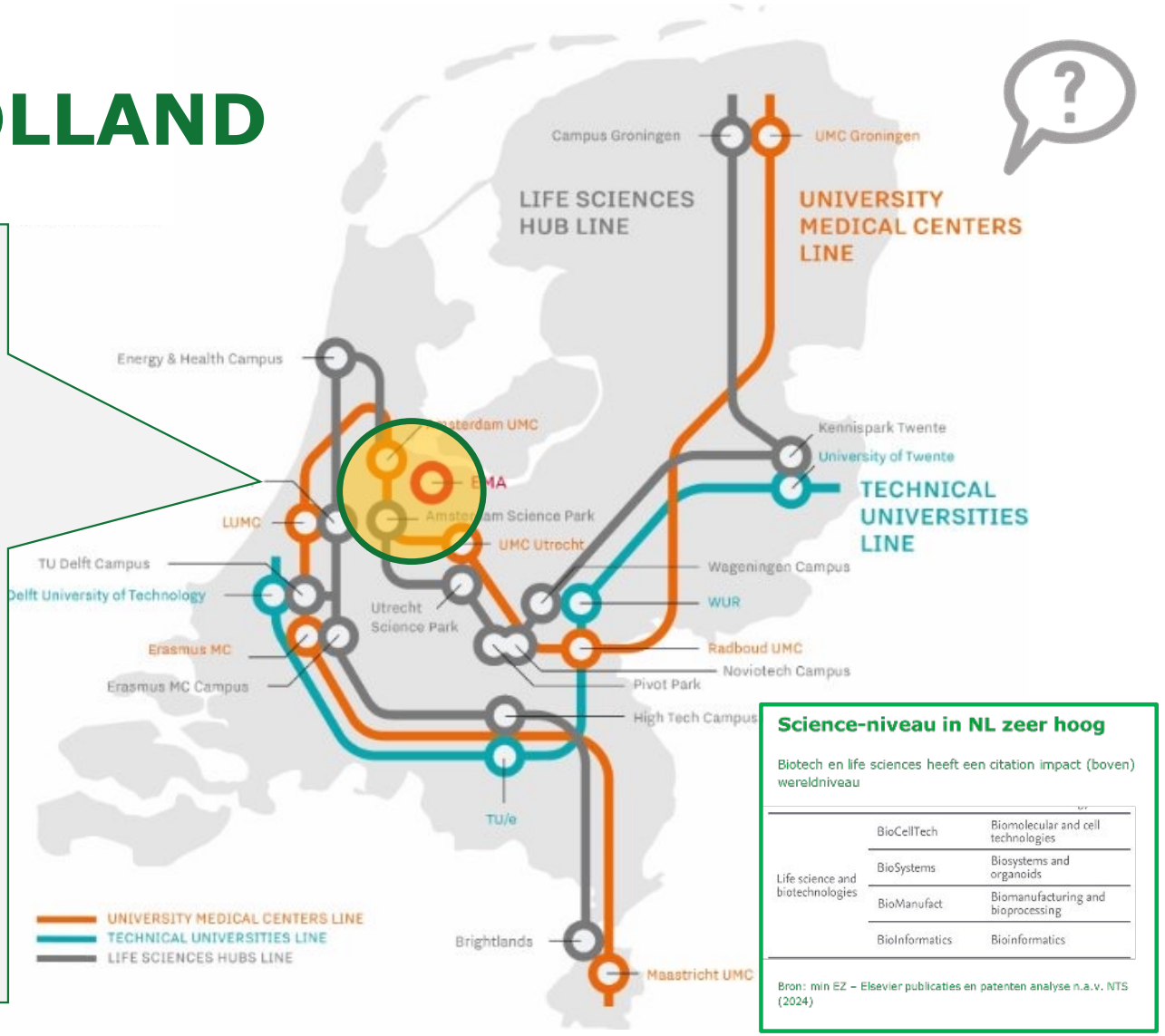
2,100+
Ongoing clinical trials

200+
Biobanks and cohorts

Een kwart van de NL LSH sector zit in Noord-Holland*

ruim 17.000 directe R&D en high tech business fte

plus nog AUMC kliniek en onderwijs (~10.000 fte) niet meegeteld



Science-niveau in NL zeer hoog

Biotech en life sciences heeft een citation impact (boven) wereldniveau

Life science and biotechnologies	BioCellTech	Biomolecular and cell technologies
	BioSystems	Biosystems and organoids
	BioManufact	Biomanufacturing and bioprocessing
	BioInformatics	Bioinformatics

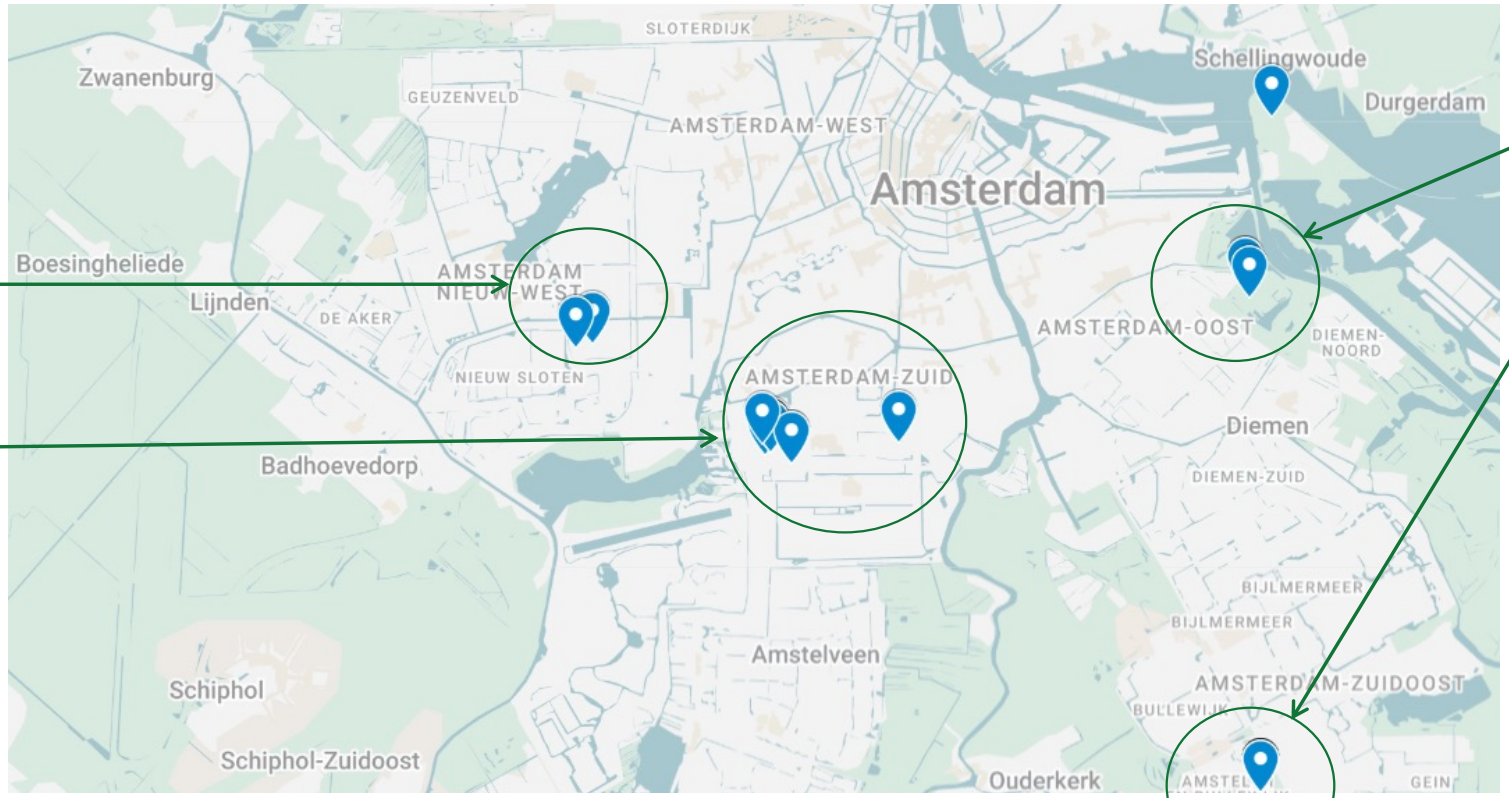
Bron: min EZ – Elsevier publicaties en patenten analyse n.a.v. NTS (2024)

Bron: NFIA bidbook EMA 2023 en Equator Research 2025 / ROM InWest

INSTITUTEN IN AMSTERDAM IN VIER SCIENCE PARKS

Health Innovation District: NKI & Sanquin Slotervaart

Zuidas Amsterdam UMC locatie VUmc: & EMA



Science Park Amsterdam

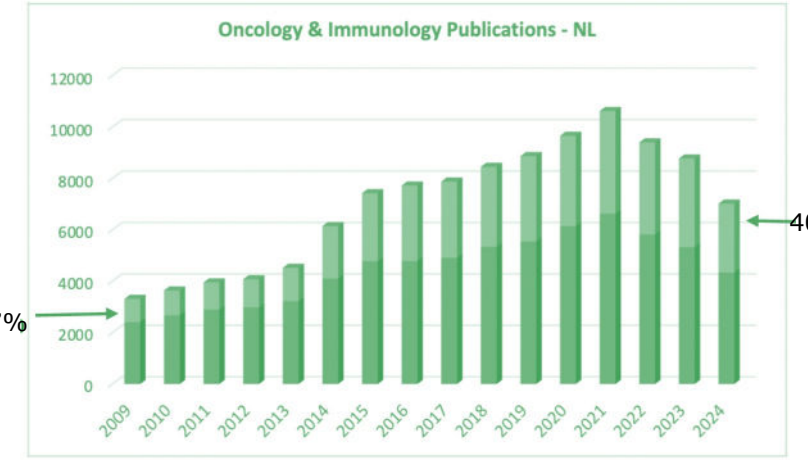
Rondom Amsterdam UMC locatie AMC: Amsterdam Life Sciences District En Medical Business Park

AMSTERDAM COMPLEMENTEERT HET NEDERLANDSE BIOTECH KENNIS- EN INNOVATIELANDSCHAP

Oncologie
Neurologie
Cardiologie
Immuno-logie

Sterke samenwerking met andere biotechcentra, ieder met excellentiegebieden zoals

Leiden:	biofarmacie, geneesmiddelen, vaccins, medtech;
Utrecht:	reg med, organoïden, medtech, e-health;
Brabant/Oss:	geneesmiddelenontwikkeling, productie, vaccins;
Maastricht:	reg med, cardiovasculair onderzoek, biomaterialen;
Groningen:	healthy aging, drug discovery, moleculaire biotechnologie



Amsterdam excels in cancer research, in particular in oncology and immunology research: 40% of all Dutch publications in these fields are from Amsterdam.

Oncode, 2025

Amsterdam Top 10 strongest topics (article output 2014 – 2023): (out of 879 scientific fields):

- **Radiotherapy Physics and Technology**
- **Positron Emission Tomography Imaging in Oncology**
- **Cancer Immunotherapy**
- **Therapeutic Antibodies: development, engineering and applications**
- **Advancements in lung cancer research**
- **Diagnosis and treatment of lung cancer**
- **Chimeric Antigen Receptor T-cell therapy**
- **Immunobiology of dendritic cells**
- **Advanced cardiac imaging techniques and diagnostics**
- **Focused ultrasound technology and applications**

AMSTERDAMSE BIOTECH ECOSYSTEMEN VOOR KENNIS, INNOVATIE EN BEDRIJVEN HEBBEN UITSTEKENDE RANDVOORWAARDEN

Kennis en R&D –instituten en science parks

- Amsterdam UMC met 8 kennisinstituten (en totaal al 16.500 medewerkers)
- Betafaculteiten van VU en UvA,
- Biomedische Techniek HvA,
- NKI / AVL
- Sanquin,
- NIN (KNAW)
- ACTA
- AI Amsterdam (Centre Digital Drug Design Amsterdam i.o.).

Innovatie en valorisatie

- Amsterdam-UMC, Sanquin, Netherland Cancer Institute produce a growing number of startups.
- Life Science Health a increasing priority at City of Amsterdam, Amsterdam Economic Board and Provincie North-Holland

Bedrijfsecosysteem

- Ruim 17.000 directe R&D en high tech business jobs in private LSH sector
- In private biotech R&D sector 7700 fte werkzaam
- 200 biotechbedrijven in de regio

LEADING RESEARCH POSITION

Amsterdamse focus op kankeronderzoek, smart health en AI gedreven gezondheidsonderzoek, zoals VectorY, Cradle, Digi.bio, CimCure.

	Number of publications in 2021	% primary authorships
Amsterdam UMC	7874	75%
Erasmus MC	4535	84%
LUMC	3290	82%
Maastricht UMC+	3971	84%
Radboudumc	3926	77%
UMC Utrecht	3512	80%
UMCG	4533	84%

Table 8: Overview of the percentage of primary authorships of publications from 2021 per umc

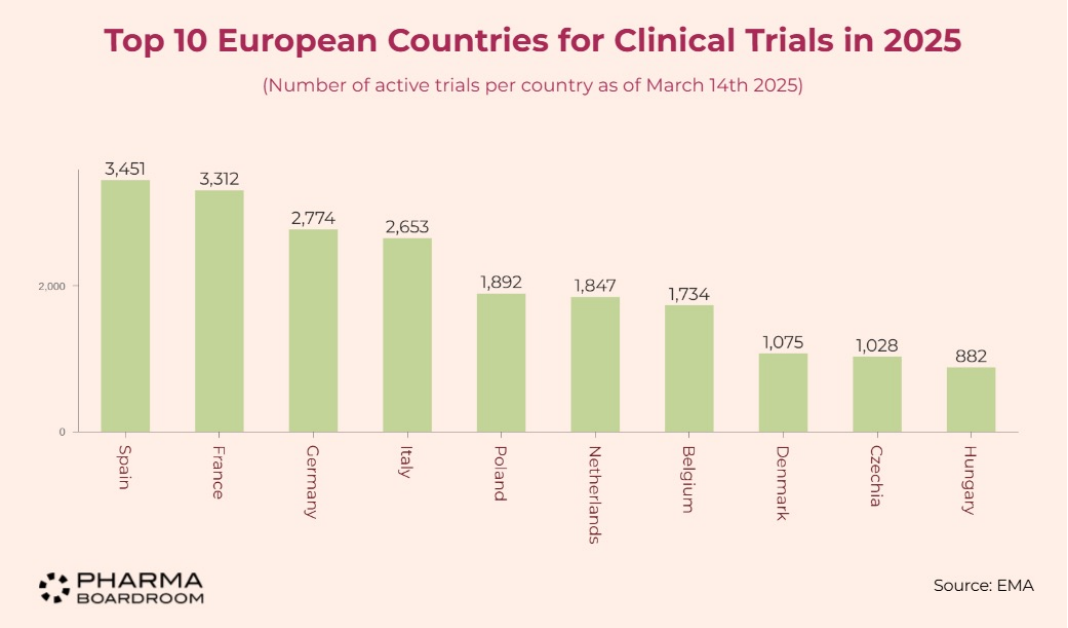
2024 https://www.nfu.nl/sites/default/files/2024-07/NFU_CWTS_profileringsrapportage-juni_2024.pdf)

TOP 10 POSITIE IN WETENSCHAP EN TRIALS

Leading countries in health sciences 2024

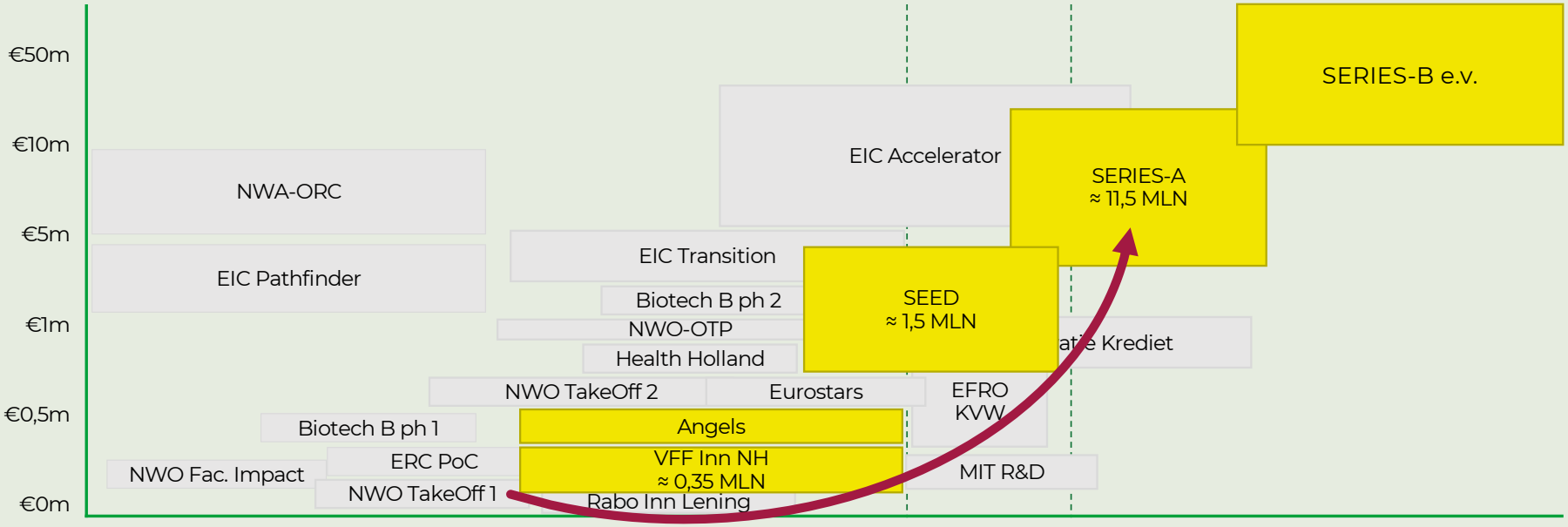
Countries are ranked by article Share in 2023. Also listed are each country's article Count in 2023, Share in 2022 and percentage change in adjusted Share from 2022 to 2023. Adjusted Share is calculated by adjusting Share values to 2023 levels.

Rank	Country	Share 2023	Count 2023	Share 2022	Change in adjusted Share 2022–23 (%)
1	United States of America	5,019.46	7,040	5,370.00	-1.50%
2	China	1,400.68	1,940	1,288.99	14.60%
3	United Kingdom	859.64	2,261	965.72	-6.20%
4	Germany	510.94	1,431	561.14	-4.00%
5	Canada	464.19	1,303	523.85	-6.60%
6	France	404.02	1,101	453.93	-6.20%
7	Netherlands	348.75	978	358.16	2.60%
8	Australia	332.82	939	385.36	-9.00%
9	Japan	286.88	651	330.81	-8.60%
10	Denmark	278.20	676	212.42	38.10%



Bron: Nature.com; EMA en Pharma Boardroom; Citeline ism o.a. Health Holland (The Netherlands Positioning Within the European Clinical Trials Ecosystem)

Funding available for startup development



	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
Activiteit	Desk-research	Hypoth & simulation	In vitro	Assays; animal M	Dose-resp &metab	Phase I	Phase II &GMP	Phase III	Phase IV
Milestone →	Idea	PoP	PoC	Tox	TPP	Submission *(EMA or FDA)*		Approval *(EMA or FDA)*	

Bron: www.medicalcountermeasures.gov, McKinsey, ROM InWest / Equator Research

Non dilutive | Dilutive

	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
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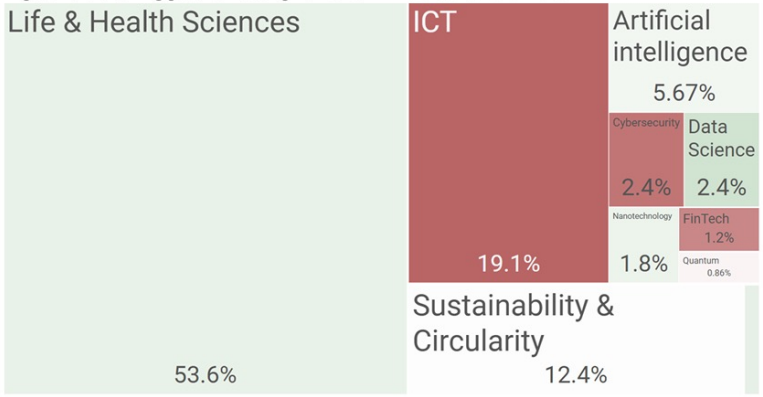
Milestone →	Idea	PoP	PoC	Tox	TPP	EMA-subm		EMA-approval	

R&D phase	**Description**	**TRL**
Research – discovery activities, hit generation and testing	Generation of chemical starting points (hits) from screens or other drug discovery strategies	2
Research – lead compound identification	Hits are evaluated and undergo limited optimisation to identify promising lead compounds with meaningful activity against the target pathogens and possess the properties needed to make an effective and safe drug	3
Research – lead compound optimisation	Modifying and testing lead compound series to improve compound properties; selecting a candidate drug for further preclinical studies	4
Development – preclinical testing	Conducting required toxicity and efficacy in vitro and vivo studies under good laboratory practice (GLP) protocols, and chemistry, manufacturing and control (CMC) studies	5
Development – phase I clinical trials	Testing the candidate drug in healthy volunteers to determine pharmacokinetics, safe dose ranges and identify common toxicity; pharmacokinetic data feed into pharmacokinetic/pharmacodynamic (PK/PD) models to determine the most appropriate doses for the next phase	6
Development – phase II clinical trials	Testing the candidate drug in a small number of patients to obtain preliminary efficacy data and more short-term safety information; refining PK/PD models	7
Development – phase III clinical trials	Testing on a larger number of patients to document efficacy, determine non-inferiority activity (or rarely superiority) and safety compared to other indicated drugs	8

Zie ook: https://joppp.biomedcentral.com/articles/10.1186/s40545-018-0135-0/tables/1 (bevat ook preclinical in TRL 6).
TRL en RVO regelingen: https://www.rvo.nl/onderwerpen/trl

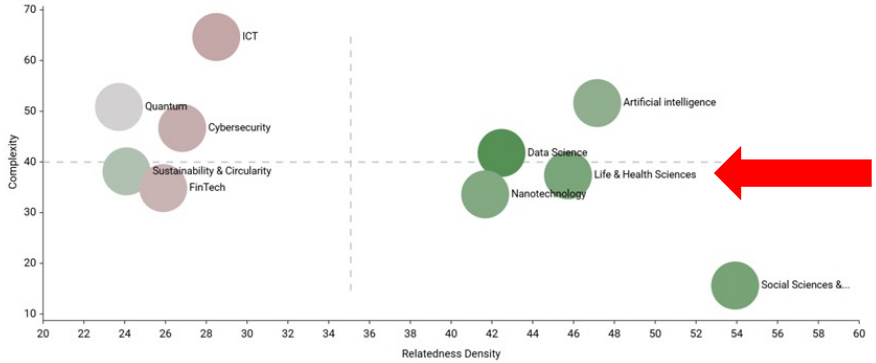
EXCELLENTE WETENSCHAPPELIJKE UITGANGSPOSITIE AMSTERDAM BIOTECH

Figuur 4. Verdeling patenten over prioriteiten Amsterdam, 2020-2023



https://www.paballand.com/asg/amsterdam/treemaps/prio/regpat/amsterdam.html

Figuur 5. Amsterdam: kansen in prioriteiten (technologieën)



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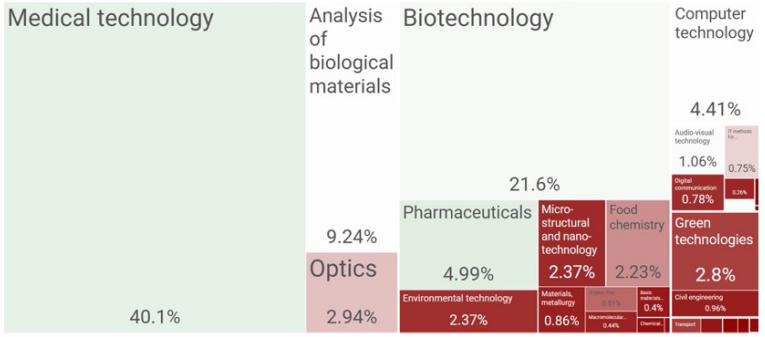
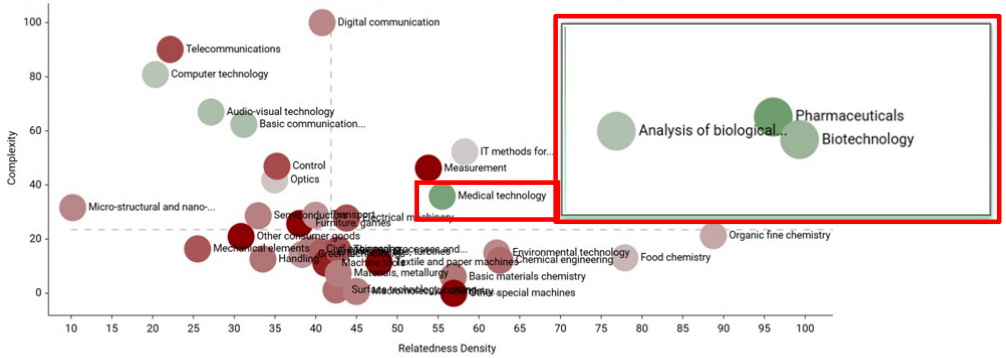
Figuur 12. Verdeling wetenschappelijke publicaties over 36 technologieën Amsterdam



https://www.paballand.com/asg/amsterdam/treemaps/wipo/openalex/amsterdam.html

Figuur 13. Kansen in alle technologieën, op basis van wetenschappelijke kennis



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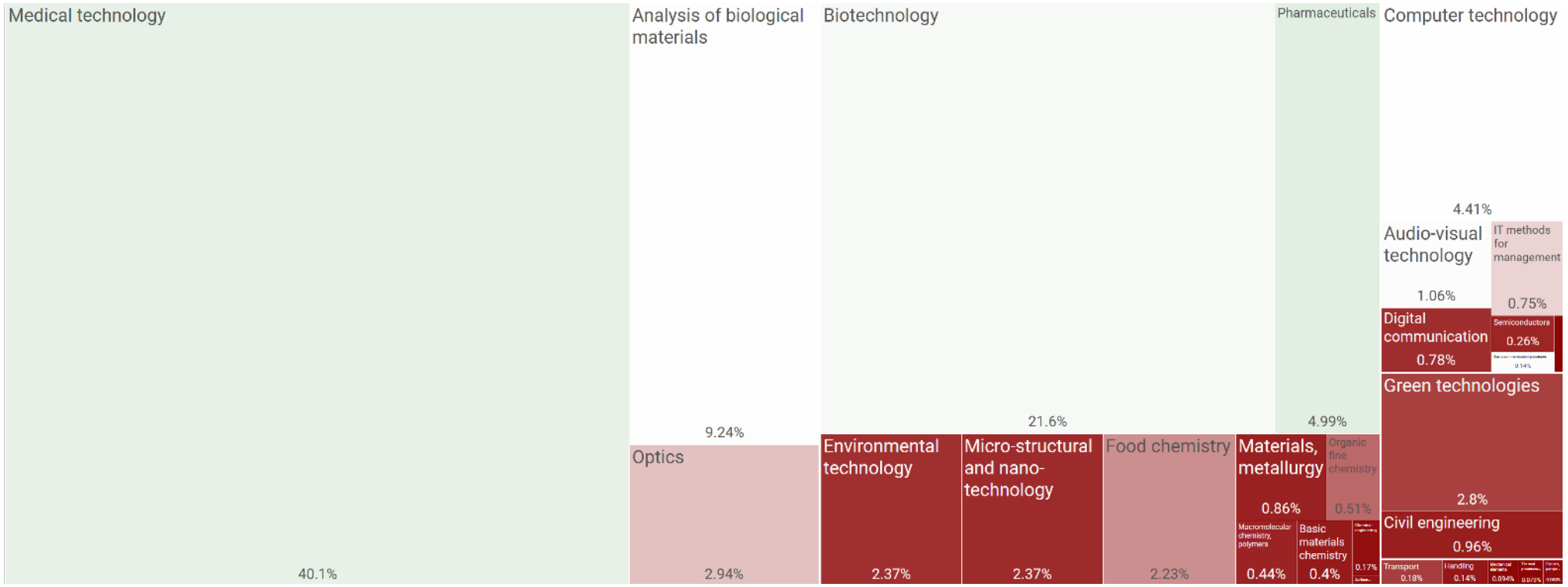
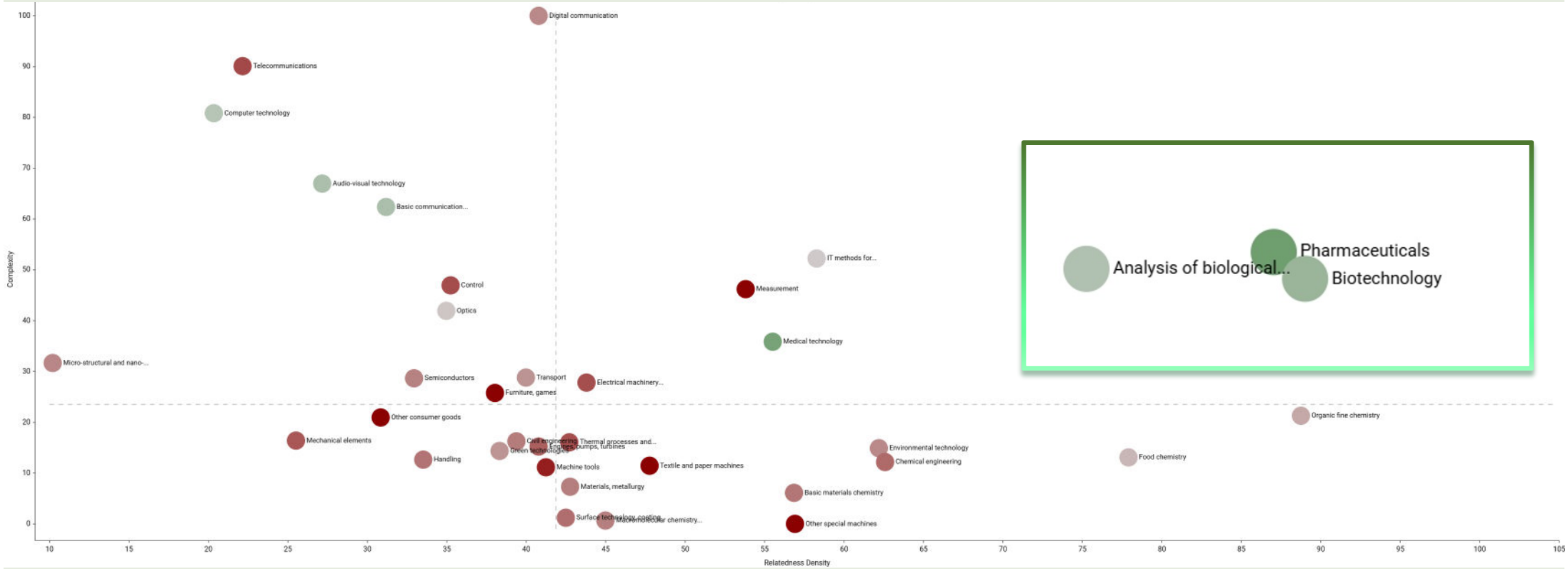
AMSTERDAM SCIENTIFIC PUBLICATIONS FOR 36 MAIN TECH FIELDS



AMSTERDAM'S STRENGHTS IN SCIENCE FIELDS



VOORBEELDEN

Back-up

DIAGNOSTIEK:
MLA ontwikkelt PCR testkit voor melanomen gebaseerd op methylerings-markers

A revolutionary prognostic test for early stage melanoma

Methylation of the promoter of lymphocyte antigen 75 (LY75) gene is a strong marker that predicts poor clinical outcome in an independent melanoma series.

Our methylation-specific PCR method for LY75 will allow clinicians to distinguish between melanoma patients who are at LOW RISK versus those who are at HIGH RISK of developing metastatic disease. By determining a patient's disease risk through a simple test performed by pathologists, a different course of treatment (either more or less intensive) can be chosen.

Therapeutics:
VectorY (A'dam) ontwikkelt ALS medicijn door werkaam eiwit met virus-vector precies op de juiste plek

VectorY THERAPEUTICS

HOME WE ARE VECTORY OUR PROGRAMS OUR SCIENCE NEWS CAREERS

Vectorized antibody technology

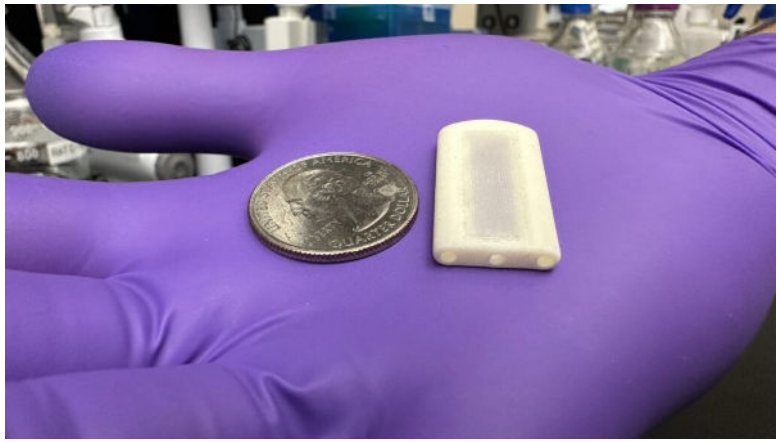
Our platform utilizes cutting-edge technologies to efficiently deliver one-time precision treatments to the central nervous system (CNS). Our therapeutic antibodies are delivered as a transgene to the target cells by a viral vector, resulting in long-term (years) expression after a single administration. The antibodies are designed to specifically bind the toxic variant of the protein or lipid and not the normal variant, these targets can be located inside or outside of a cell. Vectorization of the antibody enables us to overcome the limitations of current therapies including wide-spread CNS transduction, durability, and (intracellular) target accessibility.

VOORBEELDEN

Back-up

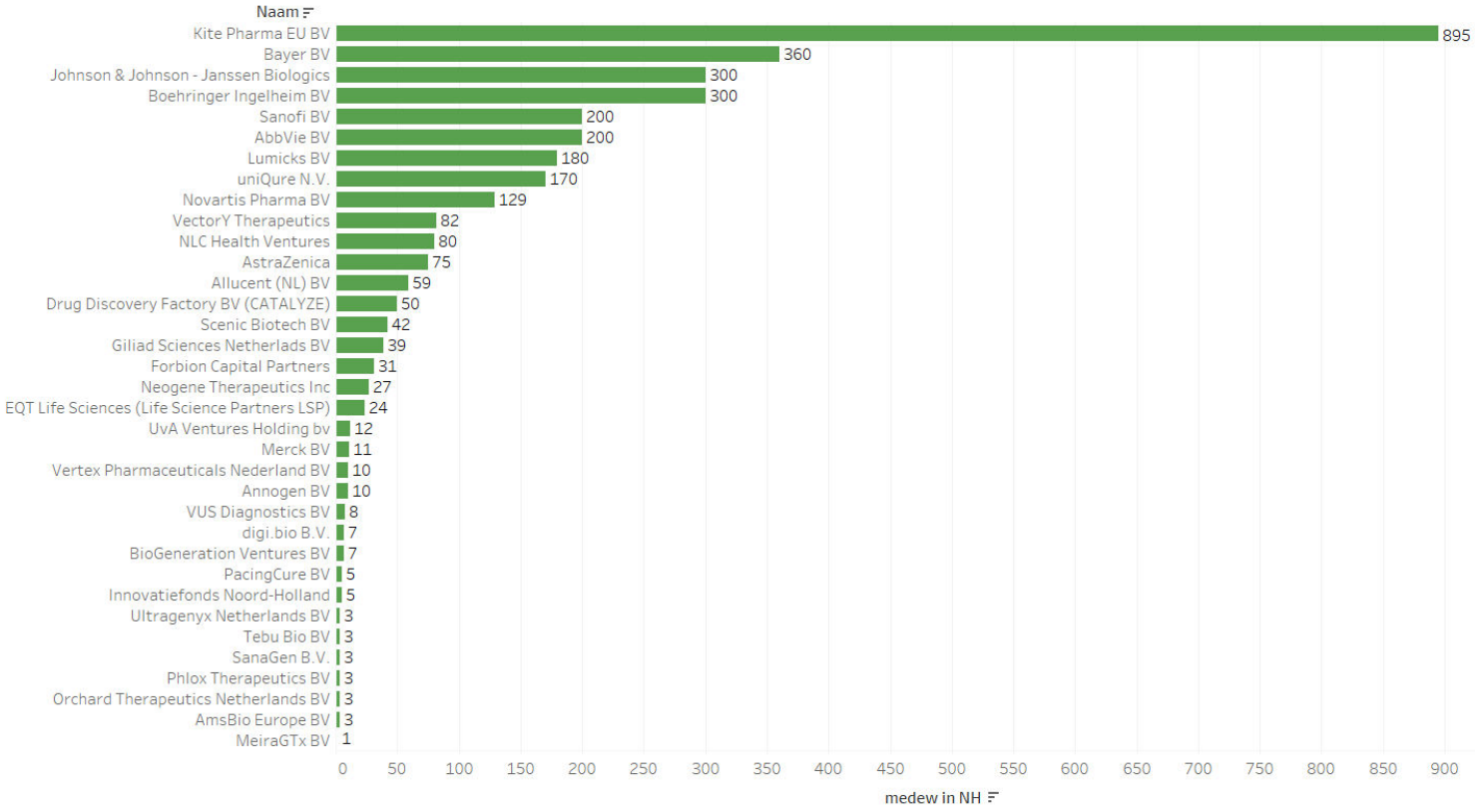
Vaccins: Rondom Schiphol (cold-chain) # belangrijke producenten vaccins zoals Abbott, Janssen, BiBio

Organoids: transgene organen transplanteren of (stam)cellen inbrengen in devices (voorbeeld diabetes cellen)



REGENERATIVE MEDICINE IN AMSTERDAM NORTH-HOLLAND

REGENERATIEVE GENEESKUNDE BEDRIJVEN
MEDEWERKERS IN NOORD-HOLLAND



BUILDING A STRONGER BIOTECH SECTOR

ROM InWest
INNOVEREN + INVESTEREN