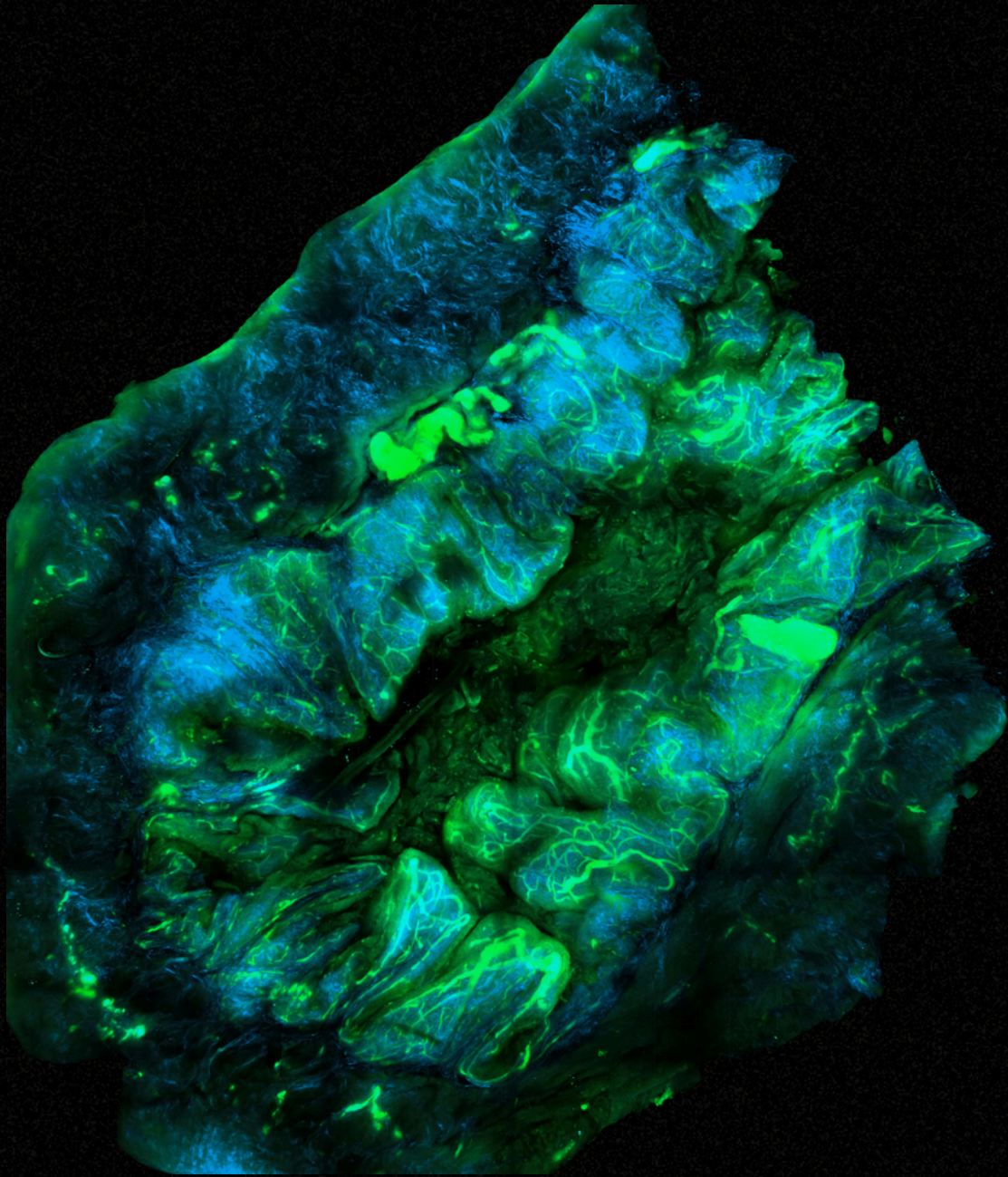




Lung Cancer Diagnosis Using AI

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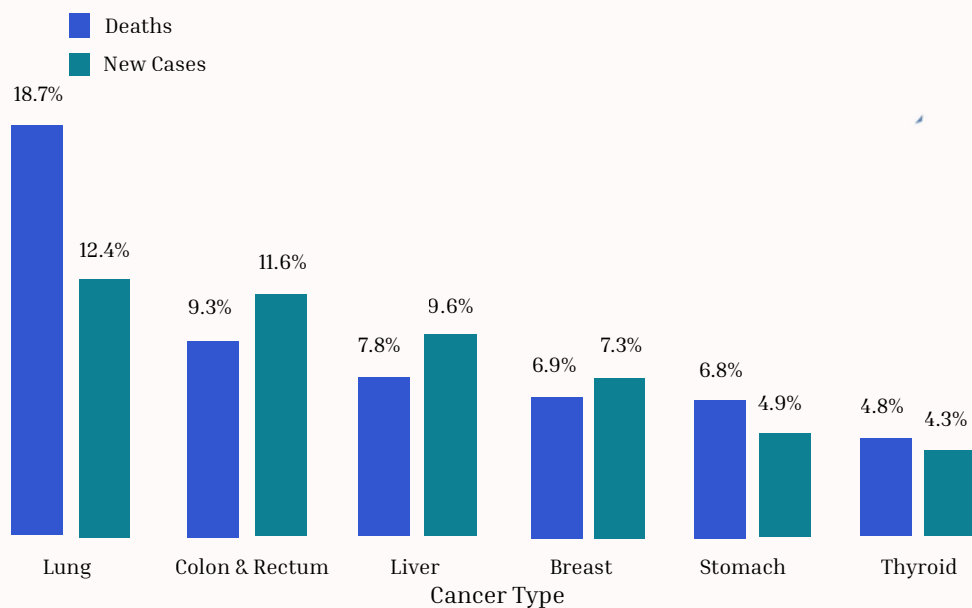
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Introduction

Diagnose lung cancer at stage 1, and roughly 65% of patients are alive five years later. Diagnose it at stage 4, and that number collapses to around 5%. Same disease, same biology, a completely different outcome, determined almost entirely by when it was found. And yet today, only about 1 in 5 patients are diagnosed early enough to be in that first group; roughly half present with disease that has already gone distant. Lung cancer isn't primarily a treatment problem. It's a detection-timing problem which is exactly why it has become one of the most contested, fastest-moving battlegrounds in applied AI.



Worldwide Cancer Deaths and New Cases in the year 2022

(Source: [American Cancer Society](#))

The clinical case for earlier detection has been settled for over a decade: low-dose CT screening cuts mortality by roughly 20% versus chest X-ray, simply by shifting diagnosis earlier. What was never solved was interpretation capacity, the ability to read every scan, catch every missed nodule, and do it consistently at population scale. That is the exact constraint AI is now being built to remove, and regulators are moving with unusual speed to let it: multiple AI-powered nodule detection and risk-scoring tools have received FDA clearance within the past year alone.

But clearance is not the same as clinical trust, and detection accuracy is not the same as competitive advantage. The more revealing evidence isn't where AI agrees with radiologists, it's where the two disagree. That gap is where this report focuses: what the data actually shows about AI's diagnostic performance against real clinical practice, where the intellectual property landscape is still open versus already crowded, and what that means strategically for the organizations building, funding, or protecting innovation in this space.

Executive Summary



Portfolio Size

- Total number of Global Active IP assets (Grants, Pending Applications, utility Models) covering AI-based diagnosis of lung cancer are ~ 1948 INPADOC families.
- 246 Granted Patents identified in the technology domain. Along with this, there are 1700 Applications and 2 Utility Models.



Patenting Trend and Geographical Distribution

- Patent filings witnessed an upward growth from 2015. Maximum number of patents were filed in 2023.
- CN, US and IN dominate the patent landscape with 72.4 % IP assets (1411 patents). Whitespaces in Canada, Germany, New Zealand, Argentina, Denmark, Israel and Italy. Europe stands at 8th position with 38 patents.



Top Assignees

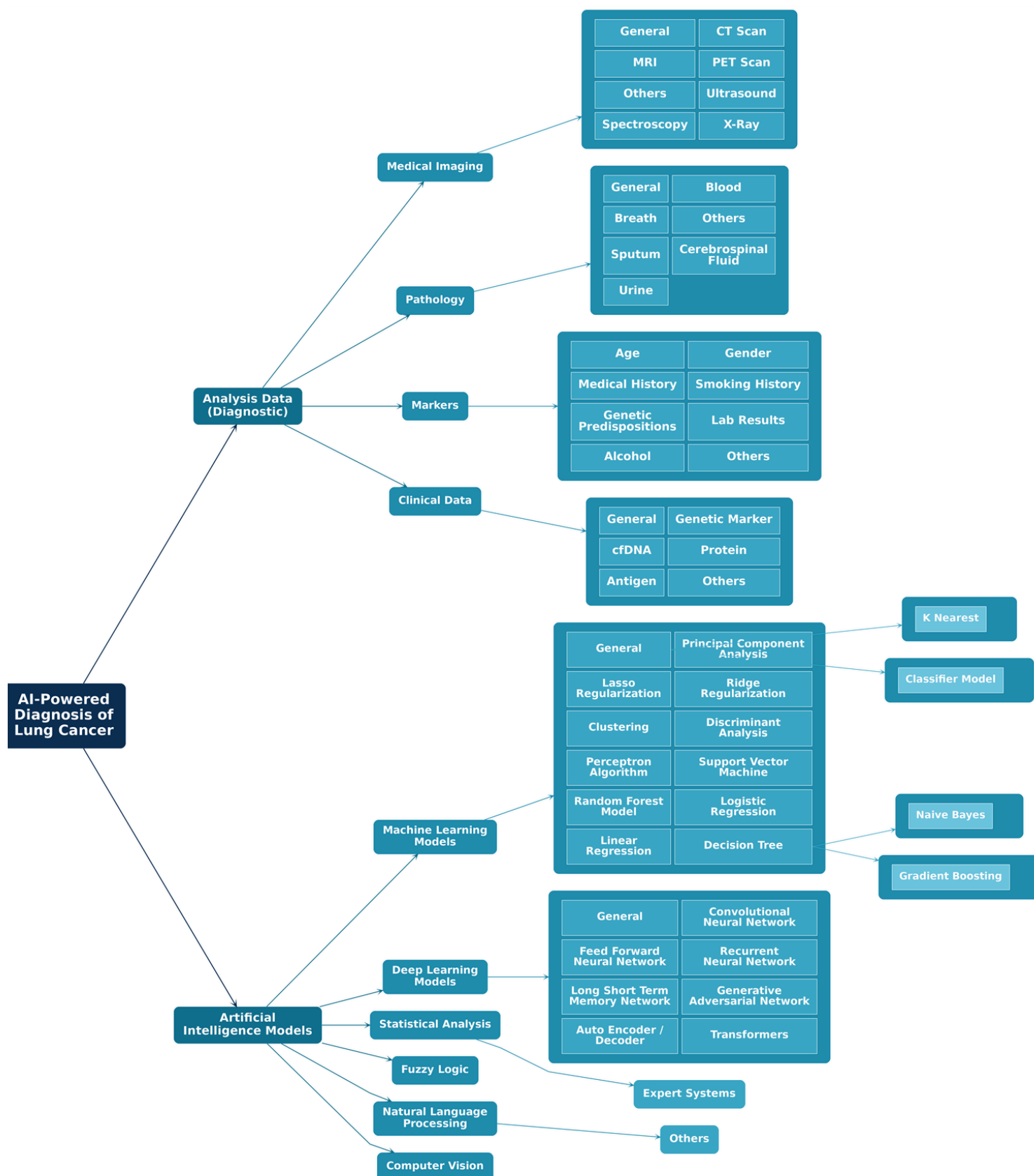
- GRAIL INC., PLA Academy of Military Sciences, and Fudan University are the top assignees in the domain of AI-based lung cancer diagnosis., each possessing 90, 36, and 26 IP assets, respectively. This includes filings in collaboration with other institutes/companies.
- Grail Inc dominates the field of artificial Intelligence-based diagnosis of lung cancer. GRAIL Inc. is a biotechnology company based in Menlo Park, California. Founded in 2015, GRAIL focuses on developing technologies for early cancer detection. The company leverages high-intensity sequencing and advanced machine learning to analyze DNA fragments in the blood for cancer-specific signals. Their flagship product, the Galleri® multi-cancer early detection blood test, can detect over 50 types of cancer, including those that are often asymptomatic



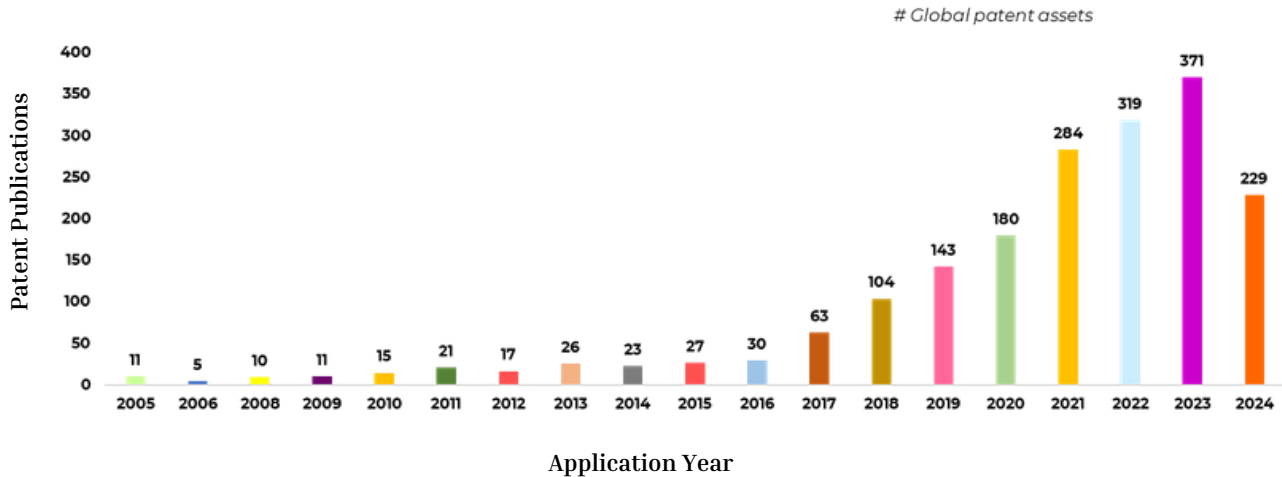
Market Trends and Litigation

- Various products in the market are using AI based models to culture lung cancer using medical imaging, biological markers, pathological and clinical data, etc.
- There are no patent litigations found in this space.

Taxonomy



Overall Filing Trends

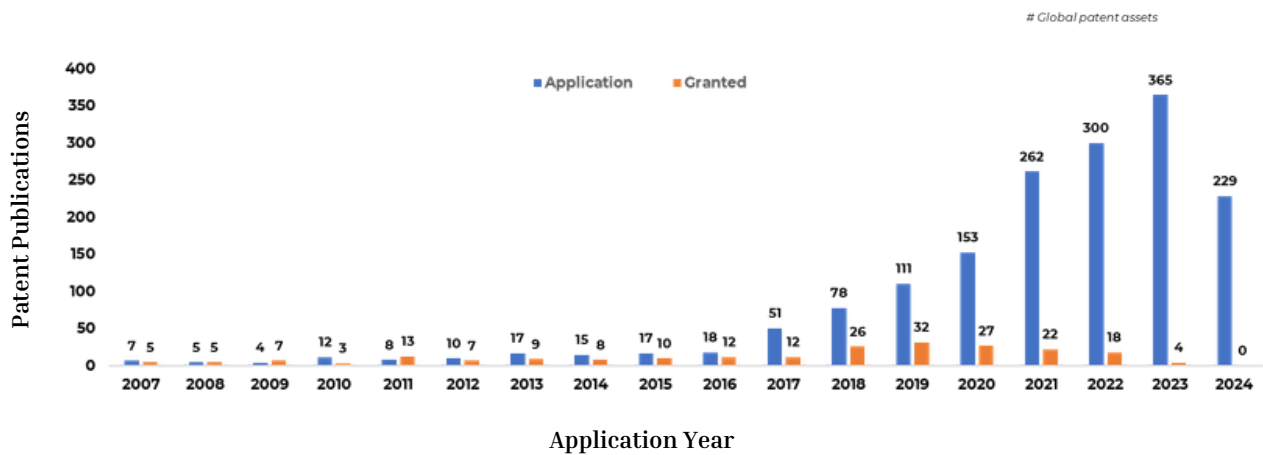


- The patent filing trends shown in the above figure depict a significant increment in the domain of "Diagnosis of Lung Cancer using Artificial Intelligence" from 2015.
- The first patent in the domain was filed in 1990 by Sichuan University. The invention related to a method for establishing markers in urine using high-performance liquid chromatography for the detection of lung cancer and nasopharyngeal cancer.
- GRAIL INC (90), PLA ACADEMY OF MILITARY SCIENCES (36), and FUDAN UNIVERSITY (26) are the top three assignees. This includes filings in collaboration with other institutes/companies.
- The maximum number of patent applications (371) were filed in 2023. GRAIL Inc. (21), Sun Yat-Sen University (12), and PLA Academy of Military Sciences (10) were the top assignees in the year.
- SIEMENS AKTIENGESELLSCHAFT has 10 filings, all in the US jurisdiction. The first patent by the assignee was filed in 2008. The invention (US8175363B2) provided a method for decomposing digital medical images of a biological structure such as a lung for disease detection. The process involved the determination of an intensity threshold for the biological structure using statistical analysis.
- More than 87% of patent applications were filed after 2016.

Notes: 1. The above chart is prepared using unique INPADOC family.

2. The number of patent applications filed in 2023/2024 may increase as some of the applications filed during this period may not have been published till date.

Filing Trend vs Grant Trend



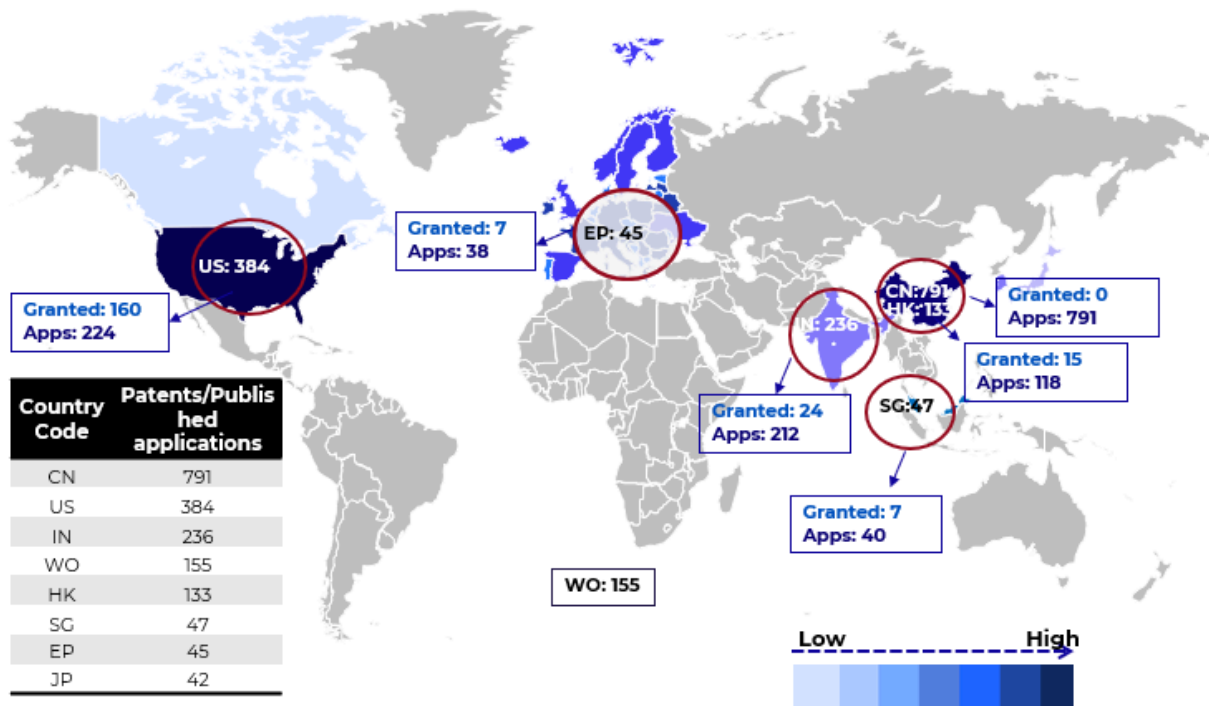
- The average number of filings per year for the last 5 years is ~ 262, whereas the average number of grants per year for the last 5 years is ~ 14 (~ 5.3 % of average filings per year).
- Companies/Universities with the highest number of filings are GRAIL Inc. (82) > PLA Academy of Military Sciences (36) > Sun Yat-Sen University (China) and Fudan University (26 each).
- Overall, only 12.6 % of patents in the domain are granted to date.
- Case Western Reserve University (12) owns the highest number of grants followed by Siemens Aktiengesellschaft (7). GRAIL Inc, Koninklijke Philips N.V., United States Health & Human Services, and Henry Jackson Foundation for the Advancement of Military Medicine have 6 granted patents each.
- ALPHABET INC. has three patents, one granted and two applications. The first patent filed by the company in this domain was in 2018. The patent discloses a system for processing medical text and associated medical images using a natural language processor. A structured label associated with each medical image is generated which indicates the presence or absence of a medical condition.

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Top Jurisdictions

Global patent assets



- CN is witnessed as the most preferred jurisdiction in the domain of “Diagnosis of Lung Cancer using Artificial Intelligence” (encompassing 40.6 % of total filings), followed by US and IN (with 19.7 % and 12.1 % of filings, respectively).
- Countries with highest number of granted patents are US (160) > IN (24) > KR and HK (15 each).
- Countries with highest number of patent filings are CN (791) > US (224) > IN (212).
- Singapore marks its presence in the domain with 2.4 % of total filings, closely followed by Europe and Japan (having 2.3 % and 2.1 % of the filings, respectively).
- Top assignee GRAIL Inc has 52 filings in HK followed by 26 in US, 8 in EP and 3 in SG jurisdiction.
- Significant patent filings (7.9 %) were filed via the PCT route (WIPO).
- Asian Countries seem to be markedly active in this domain.

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Market Insights : Overview

AI in cancer diagnostics is still a small market, \$268 million in 2024, projected to reach \$996 million by 2030 (24.1% CAGR) sitting on top of a much larger one. The broader lung cancer diagnostics market is \$5.35 billion in 2025, heading to \$9.45 billion by 2034 (6.53% CAGR). That gap 6% growth in the base market versus 24%+ in its AI layer is the entire thesis: AI isn't creating a new market, it's rapidly eating share of one that already exists.

Capital agrees. Healthcare AI startups raised \$4.24 billion across 88 rounds between Q2 2025 and Q2 2026 and the total kept climbing even after stripping out the biggest deals each quarter, meaning broad-based conviction, not a few outliers. Lung-specific players are riding the same wave, from focused screening startups to multi-cancer platforms like Freenome expanding out of colorectal testing into lung detection.

Regulatory momentum is real, and it's compressing time-to-market

Regulators are keeping pace. The FDA cleared three distinct AI lung-diagnostic tools in the first two months of 2026 alone, a clearance velocity that signals genuine regulatory comfort with the category, not just cautious pilot approvals.

Geography: the growth center is shifting east

And the growth map is shifting. North America leads today, but Asia Pacific is growing fastest, China's Healthy China 2030 plan is integrating AI reading tools directly into public CT screening infrastructure at population scale. That's a state-driven adoption engine, structurally different from the West's reimbursement-led path and it may end up setting the pace for everyone else.

Five layers, one shrinking moat

The technology is climbing a clear ladder: detect → quantify → predict malignancy → predict future risk → orchestrate diagnosis across imaging, pathology and biomarkers. Detection is increasingly commoditized, with multiple FDA-cleared products already in market; the real battleground is layers 3–5, where one nodule model fell from 0.93 AUC on its development data to 0.75 on the independent NLST dataset—underscoring that strong lab performance does not guarantee real-world generalizability.

Workflow, not accuracy, is becoming the moat.

Hospitals don't buy algorithms; they buy things that fit into PACS, Lung-RADS reporting, and follow-up tracking without adding friction. Qure.ai's strategy shows where this is heading: 5 million chest X-ray screenings across 20+ countries, now integrated directly into Microsoft's Precision Imaging Network. Distribution and workflow ownership are compounding faster than marginal accuracy gains.

Key Market Players And Their Products

quire.ai

qCT LN Quant

- Uses Non-contrast chest CT scan
- FDA Approval Status: Approved
- Measures key dimensions (average diameter, short axis, long axis) of nodules.
- Creates detailed 2D and 3D images for better visualization.
- Combines measurements with Brock malignancy risk scores.

quire.ai

qXR LN

- Uses Chest X-rays
- FDA Approval Status: Approved
- Detects and highlights pulmonary nodules (6-30 mm) using CAD.
- Provides AI-powered chest X-ray reports in under 1 minute.
- Enhances early detection, complementing CT scans with additional chest X-ray analysis.

SIEMENS
Healthineers

AI rad Companion

- Uses Chest CT Scan
- FDA Approval Status: Approved
- Enhances CT imaging by automating structure differentiation of the lungs, heart, and aorta.
- Detects abnormalities, including coronary calcifications, and supports lesion detection and measurement.
- Automates lung lobe segmentation, thoracic aorta measurements, and coronary artery calcium volume calculation for comprehensive analysis.

Lunit

INSIGHT CXR

- Uses Chest radiographs with CT images
- FDA Approval Status: Approved
- Produces localized lesion information using heatmaps and contour maps.
- AI-generated abnormality scores help assess lesion likelihood, guiding radiologists to focus on suspicious areas.



Aidoc's aiOS™ platform

- Uses Chest CT scan
- FDA Approval Status: Approved
- Aidoc's aiOS™ platform notifies radiologists of lung nodules and measures them accurately for earlier, targeted intervention in lung cancer.



Virtual Nodule Clinict

- Uses CT scan Report
- FDA Approval Status: Approved
- Optellum Virtual Nodule Clinic identifies patients with nodules for early detection.
- Increases the accuracy of malignancy assessment.



Cloud based platform

- Uses Tissue Slides
- FDA Approval Status: Approved
- Tissue slides are digitized and stored in the image management platform.
- Retrieves and analyzes images via API using deep learning models.
- Confirmed findings generate a report to guide treatment decisions, focusing on invasive carcinoma and PD-L1 status in lung cancer.



LungCT AI™

- Uses Chest CT Scan
- FDA Approval Status: PMDA Approved, MFDS (K-FDA approved), CE certified
- VUNO Med-LungCT AI helps in diagnosis of lung diseases. It provides data on nodule size, volume and location.



Red dot platform

- Uses Chest X ray
- FDA Approval Status: Approved
- The Red Dot platform uses AI to detect lung cancer, quickly identifying normal scans for radiologists to focus on critical cases.

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