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AUGUST 13, 2024

Pancreatic Cancer- Global Clinical Trial Landscape (2024)

novotech-cro.com

PANCREATIC CANCER (PC)
GLOBAL CLINICAL TRIAL LANDSCAPE (2024)

#DYK
Did you know?

PANCREATIC CANCER

12th
MOST DIAGNOSED CANCER

6th
LEADING CAUSE OF CANCER MORTALITY

Asia had the highest incidence cases and accounted for nearly **45% of the global incidence cases of PC**

Europe had the **second highest incidence**, with over 146,000 cases

North- America had **more than 67,000 cases**, followed by rest of the world (ROW)

2022: NEARLY
511k
NEW CASES

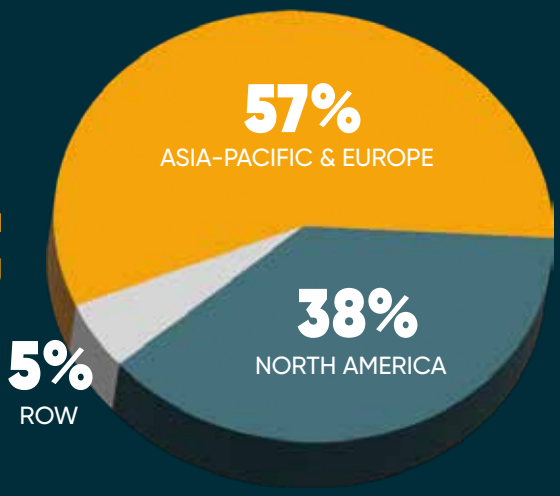
The PC treatment market offers **diverse products** by companies including **Astellas Pharma Inc., Bristol Myers Squibb Co. and GemVax & Kael Co. Ltd**

Multiple ongoing **Phase III trials** demonstrate continued efforts to enhance PC treatment **through antibody, small molecule, and protein**

PANCREATIC CANCER
TRIAL CONTRIBUTIONS

Countries like **United States, Mainland China, Australia, Spain, and South Korea** emerged as **top locations** for conducting trials

Asia-Pacific showed **faster recruitment durations** and **patient recruitment rates**



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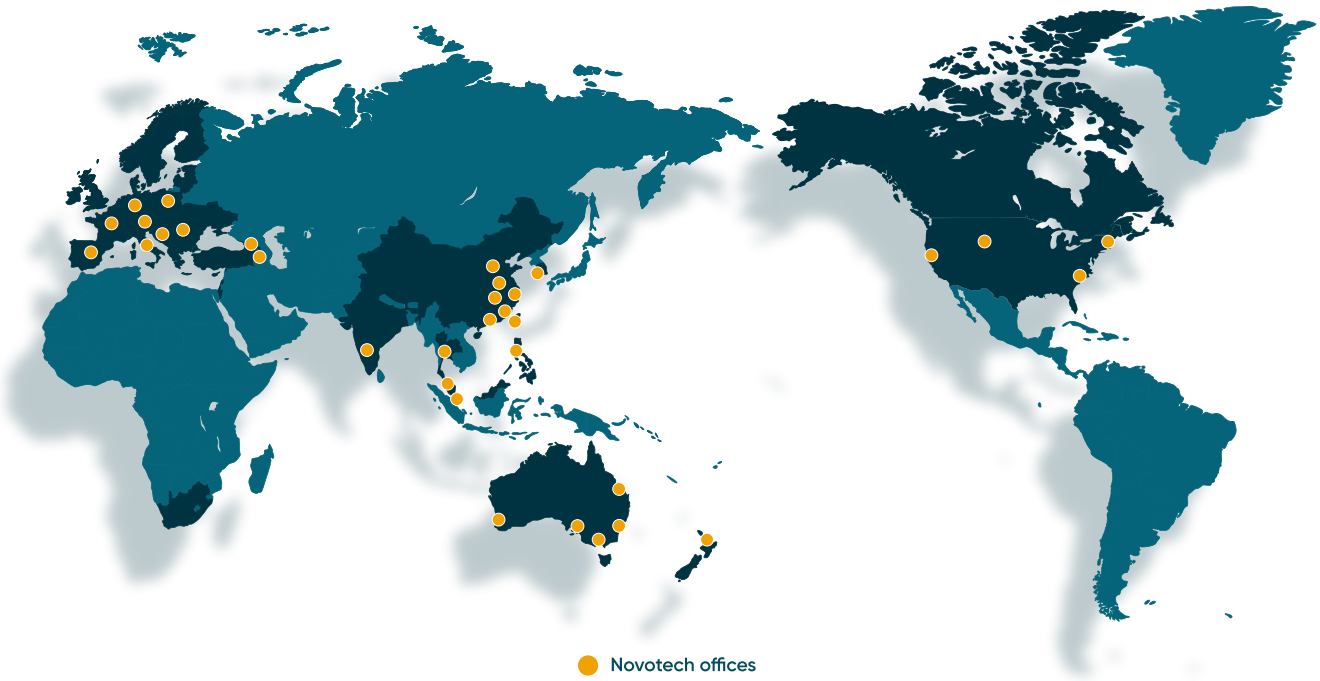


1. EPIDEMIOLOGY

Introduction

Pancreatic cancer (PC) is known to be one of the most fatal gastrointestinal cancers (1). Worldwide, PC ranks twelfth in terms of total cancer incidence and sixth in cancer-related deaths (2). Pancreatic Ductal Adenocarcinoma (PDAC) is the most common subtype, comprising about 90% of cases, while Pancreatic Neuroendocrine Tumors account for the remaining 10%. PC occurs more frequently in elderly people aged 65 and above, with males reporting greater incidences of PC than females. According to GLOBOCAN 2022, there were over 240,000 PC cases reported in females with an ASIR (age-standardized incidence rate) of 4 per 100,000 population, and close to 270,000 PC cases in males with an ASIR of 5.5 per 100,000 population (2). Although the exact etiology of PC is unknown, risk factors include age, gender, ethnicity, family history, food and lifestyle choices, pancreatitis, obesity, and infections (1). PC has a poor prognosis, and the 5-year survival rate is between 2%-10%, with slight disparities between developed and developing countries (1). PC patients are treated with targeted therapy, immunotherapy, and microbial therapy in addition to surgery, chemotherapy, radiation, and palliative care (3). This disease report provides a detailed overview of the global PC clinical trial landscape and PC burden in different locations across the globe.

Epidemiology

Globally, PC accounted for nearly 511,000 new cases and 467,400 deaths in 2022. The global ASRs (Age Standardized Rates) of incidence and mortality for PC were 4.7 and 4.2 per 100,000 population respectively. This overview highlights the incidence and prevalence of PC across various regions and locations based on the data provided by GLOBOCAN 2022.

Asia led in PC incidence, with approximately 232,500 reported cases, and accounted for nearly 45% of the global PC cases in 2022. China alone contributed over 118,600 cases. Following this, Japan and India also reported higher incidences with over 47,600 and 13,600 cases, respectively. Japan had the highest ASIR rate of 9.7 per 100,000 population. Countries like Singapore, South Korea, the Philippines, Malaysia, and Thailand showed varying ASIRs, ranging from 7.6 to 2.0 per 100,000 population.

Europe reported approximately 146,400 PC cases, with an ASIR of 8 per 100,000 population, indicating a significant but comparatively lower burden than in Asia. Germany, France, Italy, and the United Kingdom reported between 21,000 and 11,000 cases. Spain and Poland have comparatively lower incidences, highlighting the diverse epidemiological landscapes across Europe.

The North American region had over 67,000 cases with the United States alone reporting around 60,000 cases with an ASIR of 8.5 per 100,000 population. Canada reported nearly 6,900 cases with an ASIR of 7.5 per 100,000 population.

Latin America and the Caribbean reported nearly 41,000 cases of PC, with Brazil leading in this region with 14,600 cases. The region's incidence rate was 4.7 per 100,000 population, showing a considerable but relatively lower burden compared to other locations.

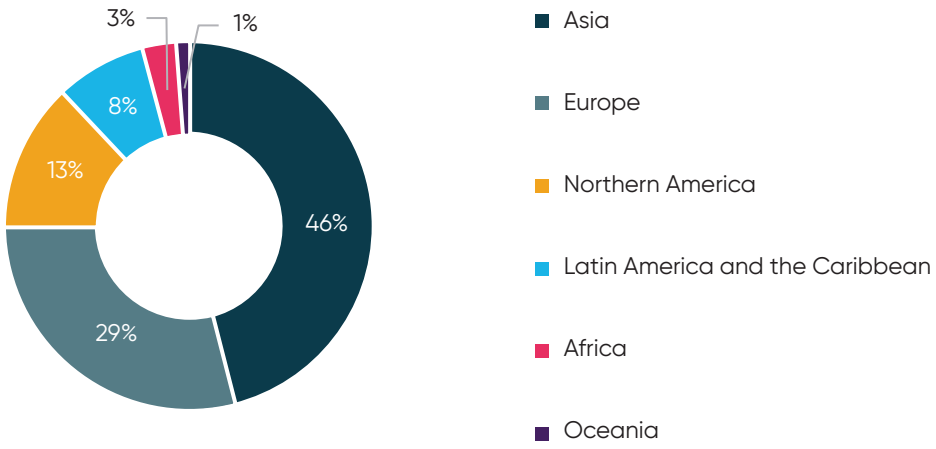
Africa reported around 18,900 PC cases in 2022, grappling with limitations in health infrastructure that might have hindered efforts to combat the disease. South Africa led in the region with more than 2,700 cases and reported a global incidence rate of 5.2 per 100,000 population.

Oceania reported the lowest numbers with over 4,800 PC cases, with an ASIR of 6.2 per 100,000 population. Australia and New Zealand contributed to the regional burden, reinforcing the need for targeted initiatives and healthcare improvement.

Over the next 25 years, predictions indicate that PC instances will continue to rise, perhaps exceeding 998,600 new cases per year by 2050 (over 95.4% increase since 2022). The huge disparities in incidence rates among the various locations highlight the need for customized prevention and treatment strategies globally. (2)

Non-Hispanic Africans have higher incidence rates than non-Hispanic Europeans due to factors like smoking, diabetes, and obesity. Even with lifestyle adjustments, non-Hispanic Africans have a 20% higher risk, likely due to biological factors like slower carcinogen metabolism and increased K-RAS mutations. Asians have lower PDAC rates and higher survival, possibly due to lower smoking and obesity rates and genetic factors like lower SPARC expression. Common mutations include BRCA2, PALB2, ATM, and CDKN2A. Even without a family history, 5-8% of PDAC patients carry predisposing mutations, highlighting the importance of multigene panel testing. (4)

Figure 1: Regional Distribution of Pancreatic Cancer



Source: GLOBOCAN2022

Table 1: Global Incidence and Prevalence of PC, by regions (2022).

Regions	Incidence		
	Cases	ASR (World)	5-year prevalence
World	510,992	4.9	337,872
Asia	232,537	3.6	213,982
Europe	146,477	8.0	123,249
Northern America	67,089	8.5	59,433
Latin America and the Caribbean	41,032	4.6	38,225
Africa	18,993	2.4	22,590
Oceania	4,864	6.2	4,000

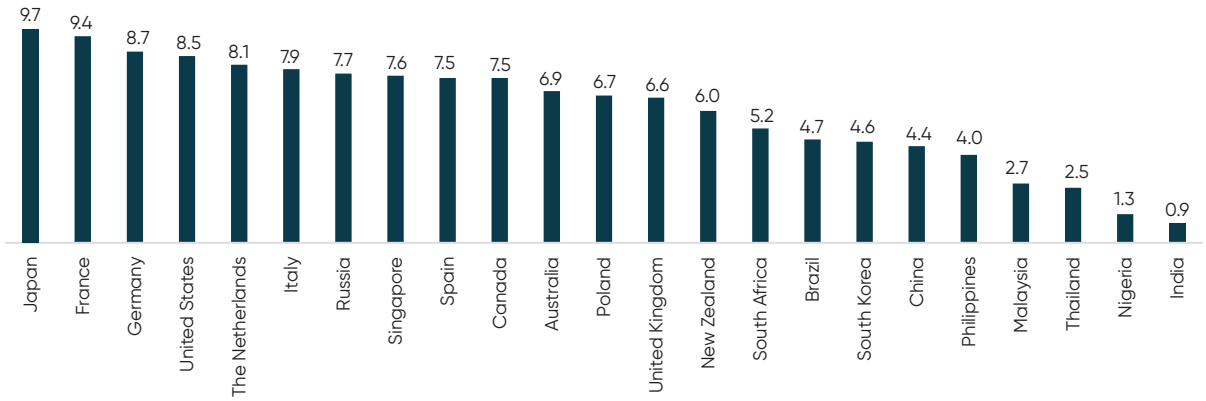
Source: GLOBOCAN 2022

Table 2: Global Incidence and Prevalence of PC, in selected locations (2022).

Locations	Incidence		
	Cases	ASR (World)	5-year prevalence
World	510,992	4.7	337,872
China	118,672	4.4	111,752
United States	60,127	8.5	53,607
Japan	47,627	9.7	32,262
Germany	21,869	8.7	16,629
Russia	21,842	7.7	21,496
France	15,895	9.4	12,882
Italy	15,710	7.9	11,570
Brazil	14,670	4.7	13,766
India	13,661	0.9	16,056

United Kingdom	11,351	6.6	9,066
South Korea	8,891	4.6	8,040
Spain	8,823	7.5	7,625
Canada	6,939	7.5	5,826
Poland	5,881	6.7	5,135
Australia	3,988	6.9	3,264
Philippines	4,045	4.0	4,338
The Netherlands	3,490	8.1	2,596
Thailand	3,314	2.5	3,248
South Africa	2,779	5.2	3,112
Nigeria	1,344	1.3	1,625
Malaysia	1,014	2.7	1,182
Singapore	923	7.6	872
New Zealand	661	6.0	544

Figure 2: Incidence rate for PC per 100,000 people in 2022 for selected locations.



Source: GLOBOCAN 2022

2. STANDARD OF CARE

The sections below discuss PC treatment guidelines and other insights from the National Comprehensive Cancer Network (NCCN), the European Society for Medical Oncology (ESMO), and the Japan Pancreas Society.

NCCN Guideline Version 2.2024

The NCCN Guideline 2024, provides essential recommendations for PC across different stages. The table below outlines preferred and other recommended regimens for systemic therapy. These evidence-based guidelines aid clinicians in tailoring treatment strategies for optimal patient outcomes. (5)

Table 3: Recommendations on PC, NCCN Guideline Version 3.2024.

Disease stage/Therapy Type	Regimen	Notes
Neoadjuvant Therapy	-	Limited evidence: practices vary with chemotherapy and radiation usage. Clinical trial encouraged.
Adjuvant Therapy	- Modified FOLFIRINOX (ECOG 0–1)	Specific regimens are recommended.
Locally Advanced Disease	- FOLFIRINOX or modified FOLFIRINOX - Gemcitabine + nab-paclitaxel	For patients with ECOG 0–1.
Metastatic Disease	• FOLFIRINOX • Gemcitabine + nab-paclitaxel • Gemcitabine + erlotinib • Gemcitabine + cisplatin (for BRCA/ PALB2 mutations)	For first-line therapy.
Maintenance Therapy	-	For patients without disease progression after 4–6 months of chemotherapy.
	- PARP inhibitors	For patients with BRCA1/2 or PALB2 mutations.
Subsequent Therapy	- Liposomal irinotecan + fluorouracil/ leucovorin	For patients who have received gemcitabine-based therapy.
	- Fluoropyrimidine-based therapy	
	- Pembrolizumab	For patients who have received gemcitabine-based therapy.
	- NTRK inhibitors (larotrectinib, entrectinib)	For patients with NTRK gene fusion positive.
	- Dabrafenib + trametinib	For patients with BRAF V600E mutation positive.

Source: NCCN Guidelines for PC (Version 2.2024); URL: https://www.nccn.org/professionals/physician_gls/pdf/pancreatic.pdf
Note: This table provides a high-level overview. Please refer to the full NCCN guidelines for complete and up-to-date information

ESMO guidelines, 2023

In addition to NCCN, the European Society for Medical Oncology (ESMO) publishes clinical practice guidelines to guide treatment decisions for PC. The figure below summarizes the ESMO recommendations for PC. (6)

Table 4: Systemic treatment for PC, ESMO 2023.

Disease Stage	Treatment Approach	Therapies
Resectable	Neoadjuvant Adjuvant	- Clinical trial - mFOLFIRINOX (ECOG PS 0-1) - Gemcitabine + Capecitabine (ECOG PS 2, age >75, frail)
Borderline Resectable	Induction Therapy Surgical Exploration	- FOLFIRINOX + CHT - GN + CHT - If fit and non-progressive, aim for R0 resection
Locally Advanced	Chemotherapy	- FOLFIRINOX - GN
	Maintenance Therapy	- PARP inhibitors (BRCA1/2 or PALB2 mutations)
	Continuation	- Continue medical treatment or discuss surgery if downstaging occurs
Advanced PC	First Line	- FOLFIRINOX (ECOG PS 0-1, bilirubin < 1.5x ULN) - GN - Gemcitabine (ECOG PS 2)
	Second Line	- GN - Gemcitabine - Nanoliposomal Irinotecan + 5-FU-LV - Alternatives: mFOLFOX6, OFF
	Symptom-directed Care	- For ECOG PS 3-4
Precision Medicine in Metastatic PC	First Line	- Maintenance Olaparib (BRCA mutations) - Pembrolizumab (MSI-H/dMMR) - Larotrectinib/Entrectinib (NTRK fusion)
	Second Line	- Rechallenge with CHT (BRCA mutations)

Source: ESMO Clinical Practice Guideline, URL: https://www.annalsofoncology.org/article/S0923-7534(23)00824-4/fulltext#secsectitle0100
Note: FOLFIRINOX: leucovorin–5-fluorouracil–irinotecan–oxaliplatin; GN: gemcitabine–nab-paclitaxel; LV: leucovorin; MDTB: multidisciplinary tumour board; mFOLFIRINOX: modified leucovorin–5-fluorouracil–irinotecan–oxaliplatin; PC: pancreatic cancer
This table provides a high-level overview. Please refer to the full ESMO guidelines for complete and up-to-date information.

Japan Pancreas Society Guidelines, 2022

The table given below reflects the Japan Pancreas Society Practice Guidelines for PC treatment, established in 2022. (7)

Table 5: Recommendations of PC, Japan Pancreas Society Practice Guidelines, 2022.

Stage of Disease	Patient Type	Therapy Type	Specific Therapies
Locally Advanced (UR-LA)	Non-elderly	First-line Chemotherapy	- FOLFIRINOX therapy - GEM + nab-PTX combination therapy - GEM monotherapy - S-1 monotherapy
		Second-line Chemotherapy	After a GEM-containing regimen: - FF + nano liposomal irinotecan combination therapy. - Fluorouracil-containing regimen After a fluorouracil-containing regimen: - GEM-containing regimen For MSI-H or TMB-H cases: - Pembrolizumab monotherapy For NTRK gene fusion cases: - Entrectinib monotherapy or larotrectinib monotherapy
	Elderly	First-line Chemotherapy	- GEM + nab-PTX combination therapy - GEM monotherapy - S-1 monotherapy
		Second-line Chemotherapy	After a GEM-containing regimen: - FF + nanoliposomal irinotecan combination therapy - Fluorouracil-containing regimen After a fluorouracil-containing regimen: - GEM-containing regimen For MSI-H or TMB-H cases: - Pembrolizumab monotherapy For NTRK gene fusion cases: - Entrectinib monotherapy or larotrectinib monotherapy
Metastatic (UR-M)	Non-elderly	First-line Chemotherapy	- FOLFIRINOX therapy - GEM + nab-PTX combination therapy When the above two treatments are not suitable: - GEM monotherapy - S-1 monotherapy
		Second-line Chemotherapy	After a GEM-containing regimen: - FF + nanoliposomal irinotecan combination therapy - Fluorouracil-containing regimen After a fluorouracil-containing regimen: - GEM-containing regimen For MSI-H or TMB-H cases: - Pembrolizumab monotherapy For NTRK gene fusion cases: - Entrectinib monotherapy or larotrectinib monotherapy
	Elderly	First-line Chemotherapy	- GEM + nab-PTX combination therapy - GEM monotherapy - S-1 monotherapy
		Second-line Chemotherapy	After a GEM-containing regimen: - FF + nanoliposomal irinotecan combination therapy - Fluorouracil-containing regimen After a fluorouracil-containing regimen: - GEM-containing regimen For MSI-H or TMB-H cases: -Pembrolizumab monotherapy For NTRK gene fusion cases: - Entrectinib monotherapy or larotrectinib monotherapy

Source Japan Pancreas Society Practice Guidelines, URL: Clinical Practice Guidelines for Pancreatic Cancer 2022 from the Japan Pancreas Society: a synopsis | International Journal of Clinical Oncology (springer.com)
Note: This table provides a high-level overview. Please refer to the full Japan Pancreas Society Practice Guidelines for complete and up-to-date information.

3. GLOBAL CLINICAL TRIAL LANDSCAPE

Since 2019, the biotech and biopharma industry initiated over 2,000 PC clinical trials worldwide. North America and Asia-Pacific each contributed a similar share of trials, at 38% and 37% respectively, followed by Europe at 20%. The ROW contributed a moderate share of 5%. The United States had the highest trial share (88%) in North America, while Canada had 12%. Mainland China led the trial activity in Asia Pacific with a majority trial share of 43%, followed by Australia (17%) and South Korea (16%). Within Europe, Spain, France, the United Kingdom, and Italy, led the PC trials, showing the region's contribution to advancing research. Among the ROW countries, Israel led the trial activity followed by Iran and Chile. (Figure 3,4,5,6,7) (8)

Figure 3: PC trials % share by region

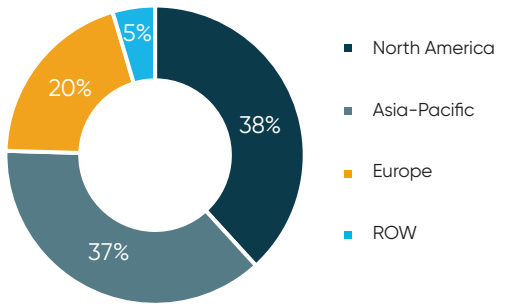


Figure 4: North America-PC trials % share

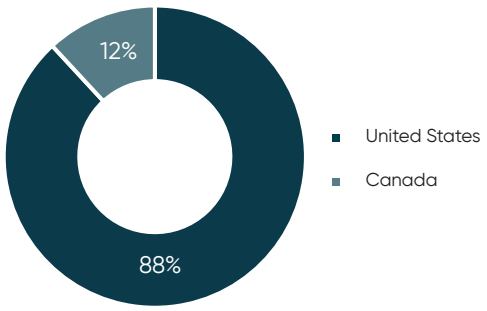


Figure 5: Asia Pacific-PC trials % share

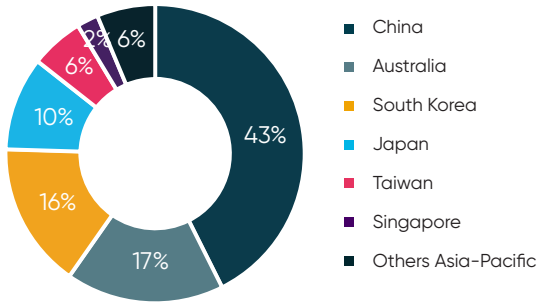


Figure 6: Europe-PC trials % share

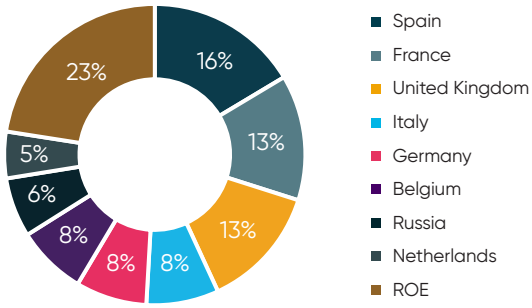
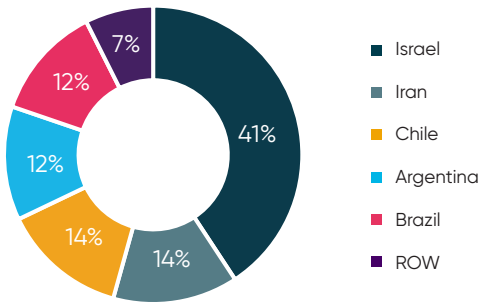


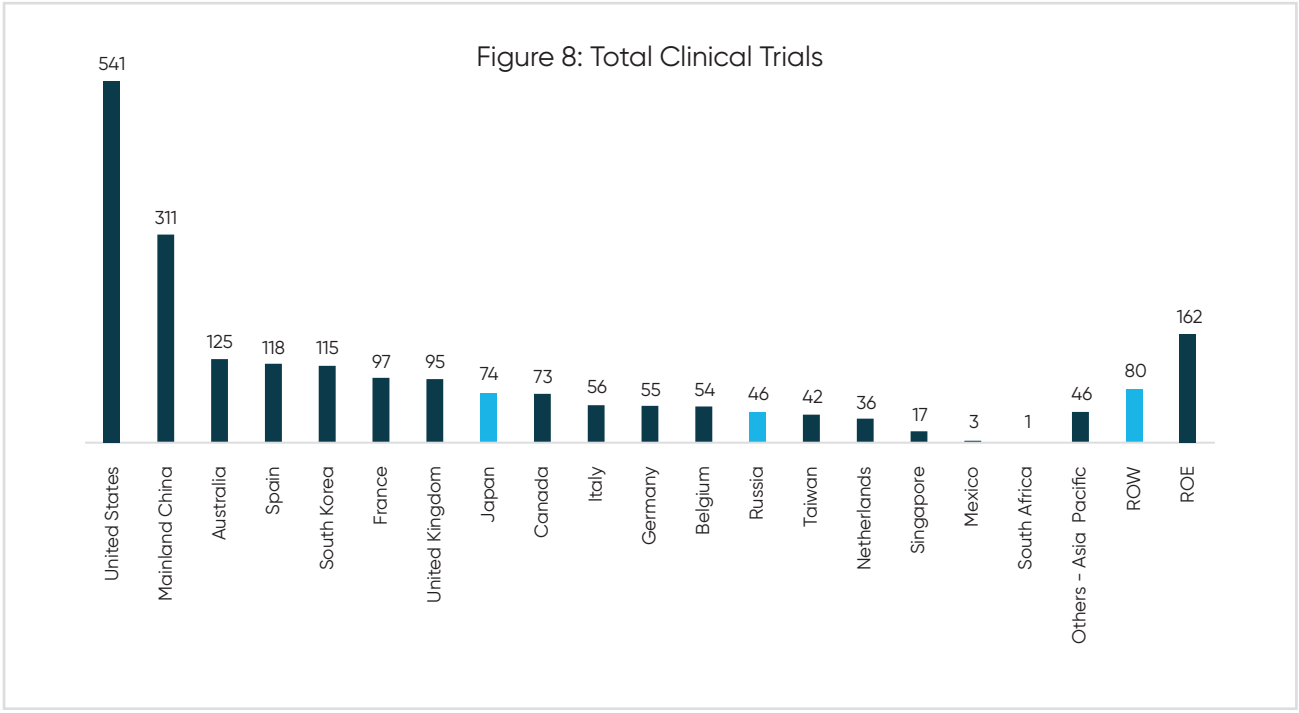
Figure 7: ROW PC trials % share



Source: GlobalData, July 2024
Others- Asia Pacific: Hong Kong, India, New Zealand, Thailand, Malaysia, and Vietnam
ROE: (excluding Russia)
ROW: Includes Middle East and Africa and South and Central America

The global landscape of PC trials reflects a strong focus on advancing research for novel therapeutics to effectively treat PC. Locations like the United States, Mainland China, Australia, Spain, and South Korea emerged as the top destinations for conducting trials. These trials reflect a consistent global effort towards PC research, though the intensity varies considerably across different countries and regions. (Figure 8). (8)

Figure 8: Total Clinical Trials



Locations where Novotech directly operates.

Others- Asia Pacific: Hong Kong, India, New Zealand, Thailand, Malaysia, and Vietnam
ROE: (excluding Russia)
ROW: Includes Middle East and Africa and South and Central America
Source: GlobalData, July 2024

Moving on to trial phase trends, PC trials have shown advancements in various regions. North America, Asia-Pacific, and Europe mostly focus on early and mid-stage development, comprising Phase I and Phase II. ROW, on the other hand, participates to a lesser extent in different phases of the trials yet makes a moderate contribution to the overall global PC research. This suggests a potential difference in regional approaches to clinical research, possibly influenced by factors like funding availability, regulatory environments, and healthcare infrastructure. (Figures 9) (8)

Based on the trials by status, across Asia-Pacific, North America, Europe, and ROW, the number of ongoing trials exceeds that of completed ones. Ongoing PC trials outnumber completed studies due to the need for long-term follow-up to assess survival rates and delayed adverse reactions. The complexity of trials involving intricate therapy combinations, such as perioperative and multimodal treatments, necessitates longer completion times. Additionally, adaptive trial designs in oncology, which permit modifications based on interim results, further extend the duration of these trials. (Figures 10) (8)

Figure 9: Trials by phase and regions since 2019

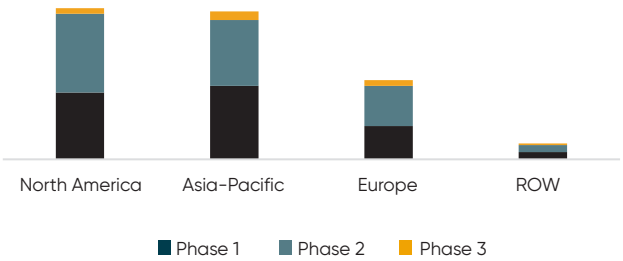
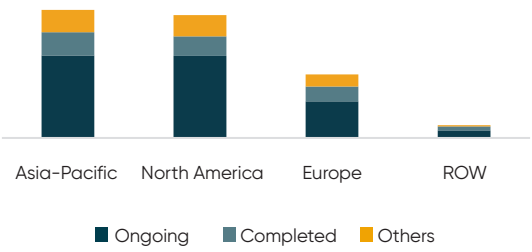


Figure 10: Trials by status and regions since 2019

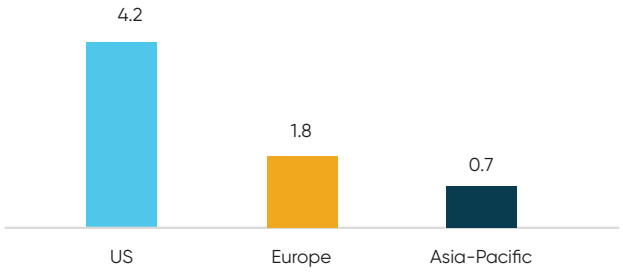


Source: GlobalData, July 2024
Others include: Planned, Suspended, Terminated, Withdrawn

Trial Density

Despite its large population, the Asia-Pacific region has a clinical trial density that is six times lower than that of the US and about half that of Europe. (Figure 11). This underscores the urgent need for increased research and targeted medical interventions in these regions. The Asia-Pacific region's comparatively lower clinical trial involvement indicates the region's untapped research potential. With a vast patient population and unique genetic diversities, particularly in countries like China, and South Korea, this region presents a prime opportunity for groundbreaking clinical research and the development of tailored therapeutic interventions. (8)

Figure 11: Trial density* for industry-sponsored PC.



**Trial density is the number of recruiting trial sites for industry-initiated trials per million urban population*
Source: GlobalData, July 2024

Patient Recruitment Landscape

Since 2019, clinical trials for PC have shown regional variations in recruitment metrics. The enrolment period data shows regional differences in clinical trial recruitment. Europe has the longest median trial duration at 27.12 months, followed by the US at 18.77, and Asia-Pacific with the shortest at 12.37 months. Additionally, the Asia-Pacific region achieved a higher median recruitment rate of 0.73 subjects per site per month, significantly outpacing the US rate of 0.29 and Europe rate of 0.20. This suggests that single-country trials running in Asia-Pacific since 2019 showcase the region's effectiveness in clinical trial initiatives and the ample availability of patient populations for such trials. (Figure 12,13). (8)

Figure 12: Enrolment Period (months), since 2019.

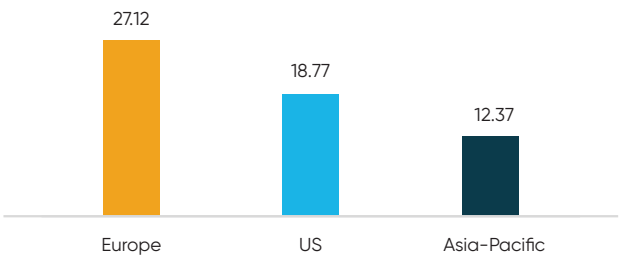
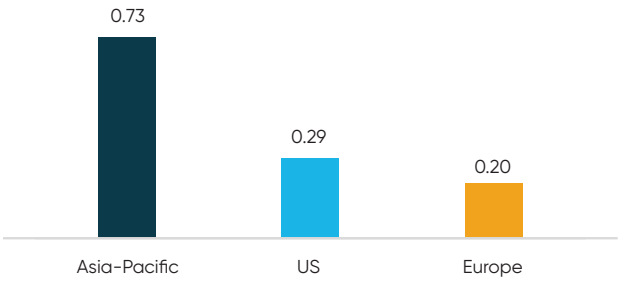


Figure 13: Subjects/Site/Month, since 2019.

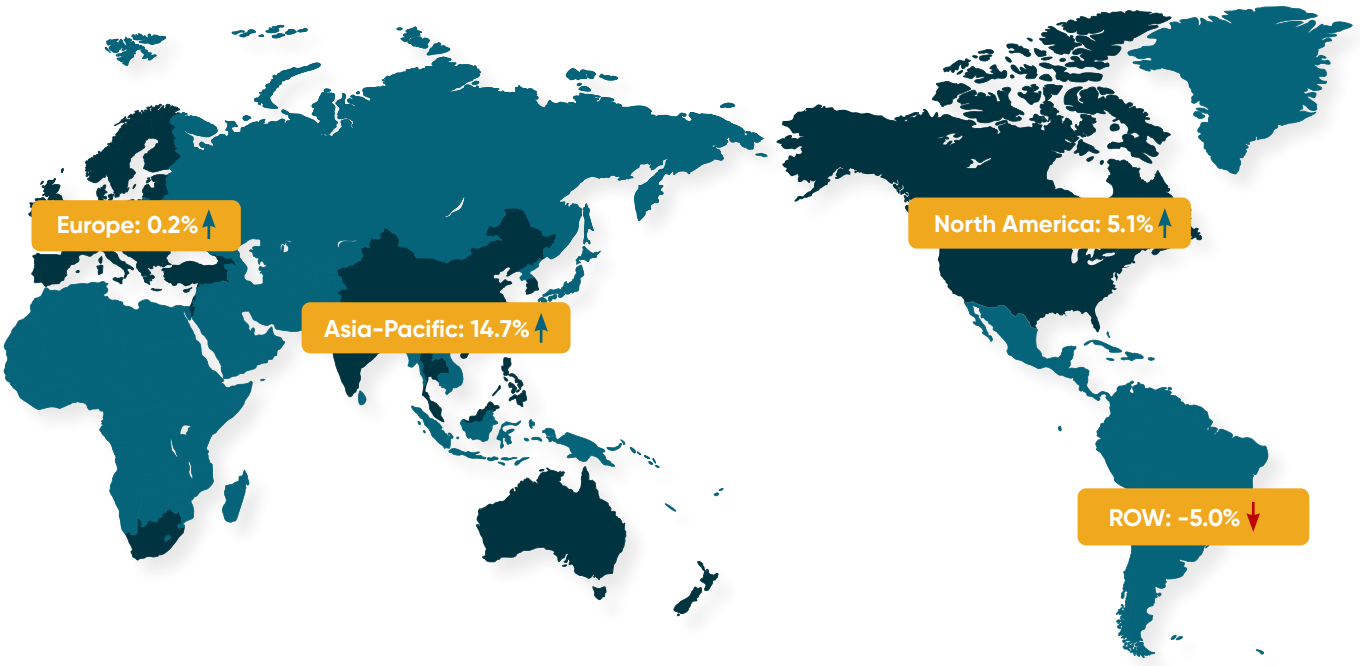


Source: GlobalData, July 2024

Growth trends of PC trials in Asia-Pacific, North America, and Europe (2014-2023)

Over the period from 2014 to 2023, the Asia-Pacific region experienced the highest increase in trial activity with a Compound Annual Growth Rate (CAGR) of 14.7%. North America followed with 5.1%, displaying a progressive trend in trial activity and Europe showed a steady and moderate growth rate at 0.2%. In contrast, the growth in ROW has declined by -5%. This trend suggests Asia-Pacific's progress in this field and a favorable research environment, while other regions also show sustained trial activity in PC. (Figure 14). (8)

Figure 14: Regional Growth Trends of PC Trials (2014-2023).

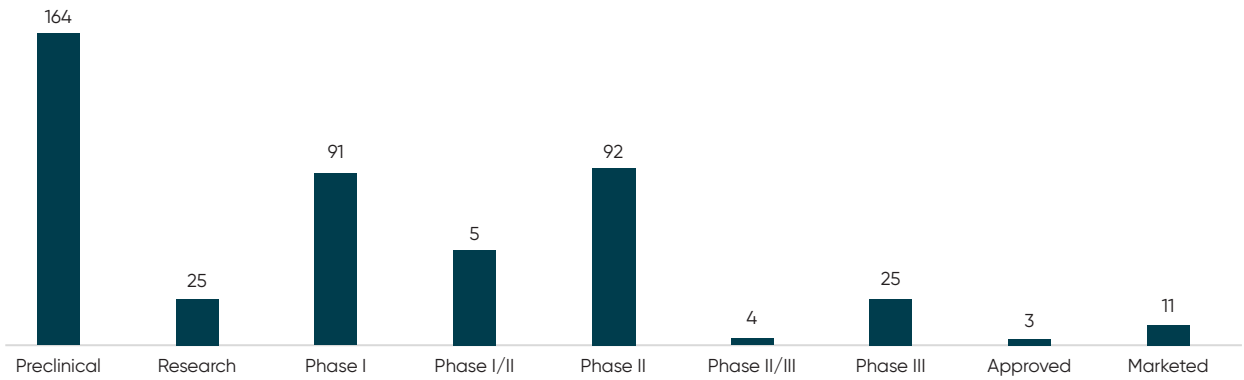


Source: GlobalData, July 2024

4. DRUG DEVELOPMENT LANDSCAPE

Across the spectrum of PC drug development by phase, there are about 164 drugs in preclinical stages, 25 in research, and 91 in Phase I trials. Additionally, 142 drugs are in Phase II, 29 in Phase III, and 11 are already in the market, reflecting a progressive landscape of PC treatments. (Figure 15) (8)

Figure 15: Number of products by phase development.



Source: Biocentury, July 2024

Among the marketed drugs by diverse mechanisms of action (MOA), Ribonucleoside Diphosphate Reductase Large Subunit Inhibitor, DNA Synthesis Inhibitor, and Thymidylate Synthase Inhibitor dominate the landscape, followed by Epidermal Growth Factor Receptor ERB1 Inhibitor, and Serine/Threonine Protein Kinase mTOR Inhibitor. In addition, other enzyme inhibitors such as Somatostatin Receptor Type 2 Agonist, Somatostatin Receptor Type 5 Agonist, DNA Topoisomerase I Inhibitor, DNA Helicase Inhibitor, and Tubulin Inhibitor, and a few others contribute to the varied drug MOA. (Figure 16)

Additionally, in the ongoing Phase III trials of PC drugs, Programmed Cell Death 1 Ligand 1 Inhibitor, Fibroblast Growth Factor Receptor 3 Antagonist, CCN Family Member 2 Inhibitor, DNA Topoisomerase I Inhibitor, and a few other MOAs. The diverse MOA observed in marketed drugs for PC underscore the complexity and tailored nature of drug development, offering promising avenues for personalized treatment approaches in disease management. (Figure 17) (8)

Figure 16: % Share of Marketed PC Drugs by Mechanism of Action

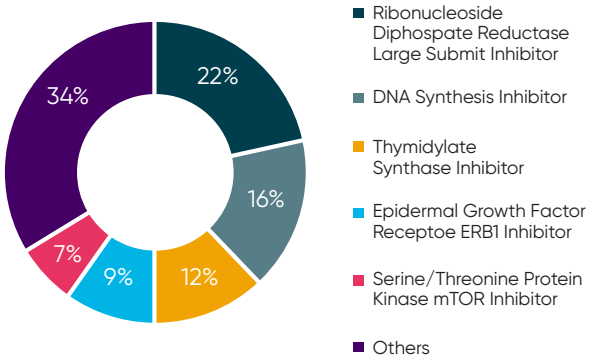
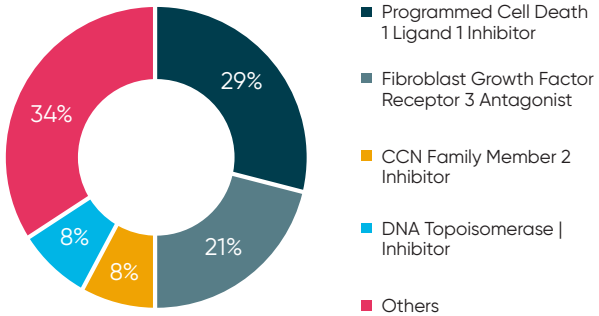


Figure 17: % Share of Phase III PC Drugs by Mechanism of Action



Source: GlobalData, June 2024

5. FUNDING LANDSCAPE

Public and NGO funding initiatives

Public and NGO (such as Pancreatic Cancer Action Network) funding initiatives are transforming the landscape of PC treatment accessibility. Regional investments by government bodies are being made to expand access to innovative therapies and improve the quality of care for affected individuals. (Figure 18) These efforts not only alleviate financial burdens but also actively work to improve patient outcomes and address unmet medical needs in the fight against PC. (9–11)

Figure 18: Public funding initiatives for PC.

Pancreatic Cancer Action Network:
The Pancreatic Cancer Action Network provides grants for basic, translational, and clinical research focused on PC. Since 2003, they have awarded 236 grants to 217 scientists across 78 institutions, amounting to a total projected research investment of approximately $208 million.

Pancreatic Cancer Action Network and National Cancer Institute:
The Pancreatic Cancer Action Network has played a cruicial role in boosting federal research funding for PC. They contributed to increasing National Cancer Institute (NCI) funding from $17 million in 1999 to over $203 million in 2021.

National Cancer Institute:
The NCI offers substantial funding for PC research through a range of grants and programs, supporting basic, clinical, and translational research focused on understanding and treating pancreatic cancer.

World Pancreatic Cancer Coalition:
The World Pancreatic Cancer Coalition unites organizations globally to increase awareness and fund research for PC. Their collaborative efforts aim to improve patient outcomes and support research initiatives.

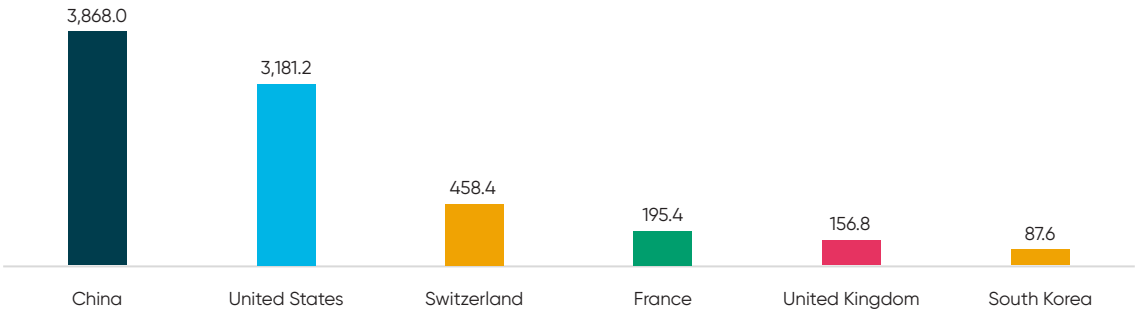
Pancreatic Cancer Research:
The Pancreatic Cancer Research organization funds projects specifically targeting PC, with the goal of improving early detection, treatment, and survival rates.

Source: Pancreatic Cancer Action Network announces $34 million in grants | Philanthropy news | PND (philanthropynewsdigest.org), PANCREATIC CANCER ACTION NETWORK (PANCAN) AWARDS MORE THAN $10.5 MILLION OF INNOVATIVE RESEARCH GRANTS, MARKING LARGEST-EVER SINGLE YEAR INVESTMENT AND BRINGING THE ORGANIZATION'S TOTAL RESEARCH INVESTMENT LAST YEAR TO $25 MILLION (prnewswire.com), Research Grants Program - Pancreatic Cancer Action Network (pancan.org).

Venture Capital Funding

Between 2019 and 2023, Venture Capital funding by locations show that China experienced an influx of venture capital, with investments of $3.87 billion, followed by United States with $3.18 billion. Countries such as Switzerland, France, the United Kingdom, and South Korea also contributed to venture funding, although to a lesser extent, with investments ranging from $458 million to $87 million. These investments reflect a global effort to advance PC research and development. (Figure 19) The top firms that received venture funding for PC include Kanaph Therapeutics Inc, CytosinLab Therapeutics Co Ltd, Netris Pharma SAS, and Bicara Therapeutics Inc.

Figure 19: Venture capital funding (US$M) for PC, 2019-2023



Source: GlobalData, July 2024

Moving on to funding by rounds of financing, PC research and development have secured funding in Series C and Series B rounds from 2019 to 2023, highlighting investor interest and promising advances in treatment strategies. (Figures 20)

Based on the stage of development, over 60% of funding supported the Preclinical, Phase I, and Phase II stages, with a slight decline in investment during the discovery phase. In contrast, Phase III, IND/CTA Filed, and Marketed stages received smaller shares, reflecting the reduced need for external investment as the drug advances towards commercialization. (Figure 21). (8)

Figure 20: Average Deals Share % by Round of Financing

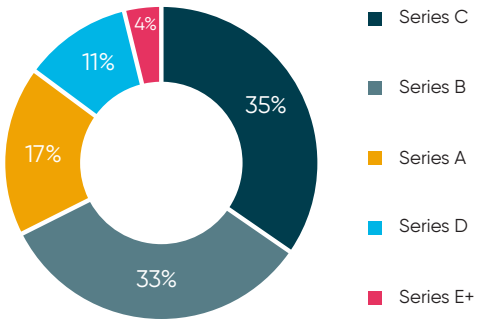
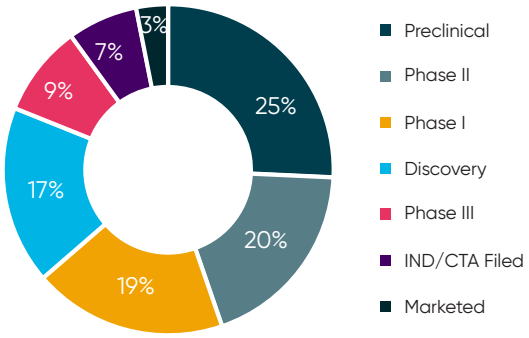


Figure 21: Average deals share % across stage of development

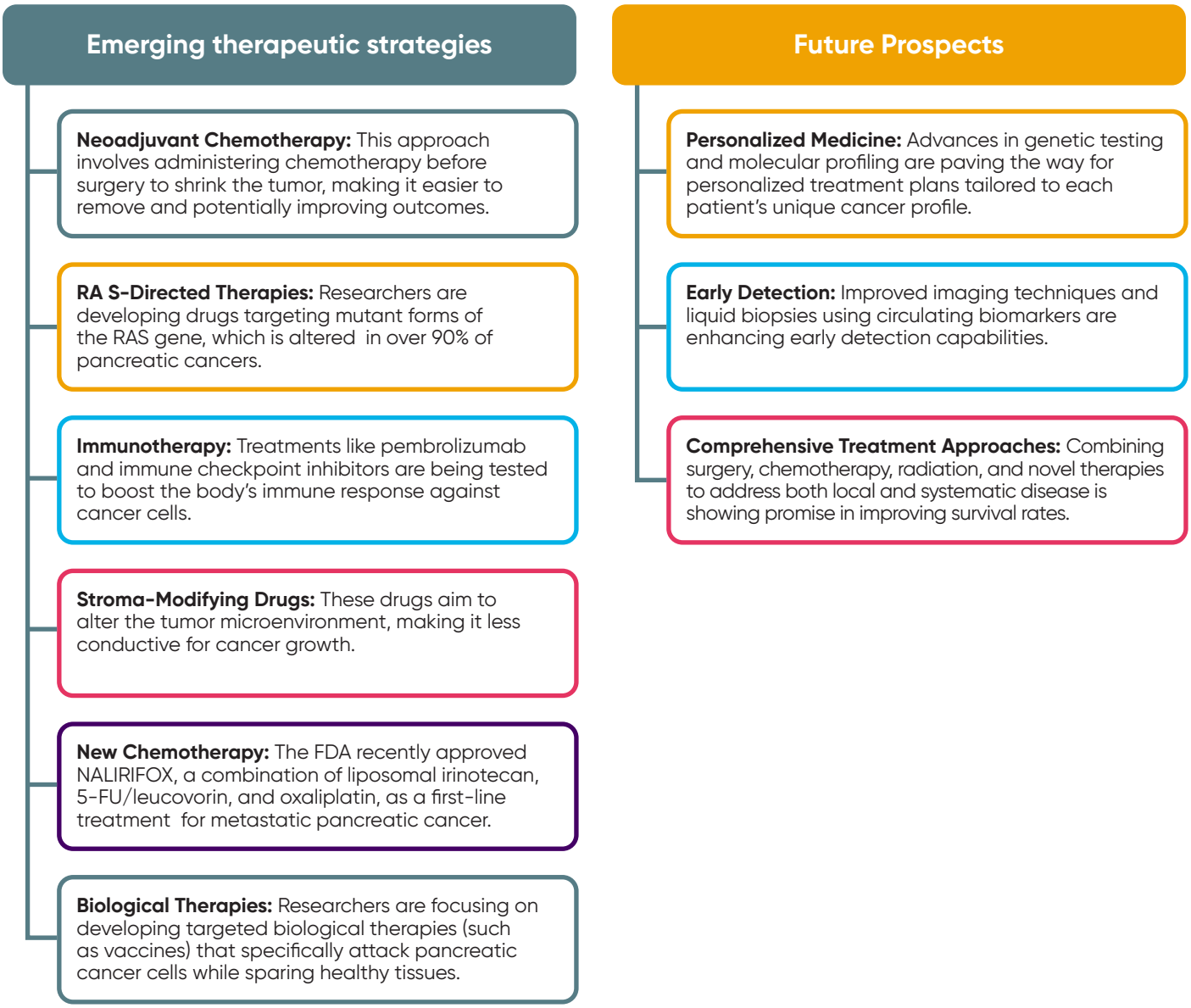


Source: GlobalData, July 2024

6. EVOLVING THERAPEUTIC STRATEGIES

PC research has seen significant advancements in recent years, offering new hope for patients and their families. Current treatments like neoadjuvant chemotherapy and innovative RAS-directed therapies are improving patient outcomes. Immunotherapy and stroma-modifying drugs are also showing promise in clinical trials. Additionally, new chemotherapy combinations, such as NALIRIFOX, have been approved for use. Looking ahead, the future of PC treatment appears promising, with advancements in personalized medicine, early detection methods, and targeted biological therapies on the horizon. Comprehensive treatment approaches combining surgery, chemotherapy, radiation, and novel therapies are expected to further enhance survival rates and quality of life for patients. (Figure 22) (12–15)

Figure 22: Emerging therapeutic strategies and Future Prospects in PC Treatment.



Source: https://www.cancer.gov/types/pancreatic/research, Cancers | Special Issue : Recent Advances in Diagnosis and Treatment of Pancreatic Cancer (mdpi.com), People with pancreatic cancer are living longer, thanks to improved approaches - Mayo Clinic Comprehensive Cancer Center Blog, FDA Approves New First-line Treatment Option for Metastatic Pancreatic Cancer - Pancreatic Cancer Action Network (pancan.org)

In conclusion, the recent therapeutic strategies in PC have evolved, improving patient outcomes. Advances in immunotherapy and personalized medicine offer hope for individuals battling this disease. Collaborations among researchers and biotech industries along with associated costs, and long-term effects are crucial for exploring these innovative therapies and technologies to improve PC care.

7. SWOT ANALYSIS

This SWOT analysis section focuses on evaluating strengths, weaknesses, opportunities, and threats in the PC treatment landscape. It systematically assesses internal and external factors, helping healthcare professionals optimize treatment strategies, address challenges, capitalize on opportunities, and enhance care for individuals with PC. (12,13,16,17)

STRENGTHS	WEAKNESSES
• **Development of new therapies:** Targeted therapies and immunotherapies are showing promise in specific patient populations. • **Research Funding:** Increased funding and grants for PC research. • **Innovative Treatment Approaches:** Development of new therapies, such as RAS-directed treatments and immunotherapies, shows promise in improving patient outcomes.	• **Late diagnosis:** PC is often diagnosed at an advanced stage, limiting treatment options. • **Low Survival Rates:** PC has one of the lowest survival rates among cancers, with a five-year survival rate of around 10%. • **Lack of early detection biomarkers:** Reliable biomarkers for early detection are still under development.

OPPORTUNITIES	THREATS
• **Advancements in Personalized Medicine:** Precision medicine and genetic profiling offer opportunities for personalized treatment plans, potentially improving efficacy and outcomes. • **Increased funding for research:** Growing awareness of the disease may lead to increased funding for research and development.	• **Stringent Regulations:** Strict regulatory requirements can limit the speed at which new PC treatments are developed and approved. • **High Treatment Costs:** The cost of advanced treatments and therapies can be prohibitive, limiting access for many patients.

ANALYSIS SUMMARY

While current treatments manage symptoms and extend lives, they have limitations and side effects. Emerging techniques, such as personalized medicine, offer hope for the future. Challenges include late diagnosis, low survival rates, and lack of early detection biomarkers. However, advancements in new therapies present opportunities to improve outcomes in PC management.

Source: https://www.cancer.org/cancer/types/pancreatic-cancer/about/new-research.html, https://www.cancer.org/cancer/types/pancreatic-cancer/about/key-statistics.html, https://www.cancer.gov/types/pancreatic/researc, https://www.mdpi.com/journal/cancers/special_issues/Advances_Diagnosis_Treatment_Pancreatic

8. APPENDIX

- The market for PC treatment is diverse, featuring products from companies like Astellas Pharma Inc., Bristol Myers Squibb Co., Sun Pharma Advanced Research Company Ltd., and GemVax & Kael Co. Ltd.
- These companies have developed various therapeutic modalities targeting different aspects of PC, such as small molecule, peptide, and drug/device combination.
- The majority of these products have already reached the market, indicating a significant advancement in PC treatment options.
- Multiple ongoing Phase III trials by AB Science S.A., FibroGen Inc. and Merck & Co. Inc. demonstrate continued efforts to enhance PC treatment through antibody, small molecule, and protein.
- Overall, these developments reflect a comprehensive approach by pharmaceutical companies to address the complexities of PC and improve patient outcomes.

Table 6: Drug Development: Recently Marketed and Phase III Trials Overview.

Company Name (Originator)	Product Name	Targets	Therapeutic Modalities	Phase of Development
Astellas Pharma Inc.	Tarceva, erlotinib (R1415, RG115, CP-358,774, OSI-774)	Epidermal growth factor receptor (EGFR) (ErbB1) (HER1)	Small molecule	Marketed
Bristol Myers Squibb Co.	Abraxane, nab-paclitaxel (ABI-007)	Tubulin	Small molecule	Marketed
Debiopharm Group	Eloxatin, Elplat, Dacotin, Dacplat, oxaliplatin	DNA	Small molecule	Marketed
Eli Lilly and Co.	Gemzar, gemcitabine	DNA polymerase; Ribonucleotide reductase	Small molecule	Marketed
GemVax & Kael Co. Ltd.	Riavax, tertomotide HCl (GV1001)	Telomerase reverse transcriptase (TERT)	Peptide	Marketed
Ipsen Group	Onivyde, irinotecan (nal-IRI, MM-398, PEP02, SHP673)	Topoisomerase I (TOP1)	Small molecule	Marketed
Pfizer Inc.	Sutent, sunitinib (SU11248)	Platelet derived growth factor receptor (PDGFR); Vascular endothelial growth factor (VEGF) receptor	Small molecule	Marketed
Simcere Pharmaceutical Group Ltd.	Sinofuan	Undisclosed	Drug/device combination	Marketed
Sun Pharma Advanced Research Company Ltd. (SPARC)	Bevetex, paclitaxel (taclantis)	Tubulin	Small molecule	Marketed
Taiho Pharmaceutical Co. Ltd.	Teysuno, tegafur/gimeracil/oteracil potassium (S-1, TS-1)	Dihydropyrimidine dehydrogenase	Combination	Marketed
Yakult Honsha Co. Ltd.	Campto, Camptosar, irinotecan	Topoisomerase I (TOP1)	Small molecule	Marketed
AB Science S.A.	Alsitek, Masiviera, masitinib (masican, masipro, AB1010)	Stem cell factor (SCF) receptor tyrosine kinase (c-Kit) (KIT) (CD117)	Small molecule	Phase III
Cancer Advances Inc.	Insegia (G17DT)	Cholecystokinin B receptor (CCKBR) (CCK2R)		Phase III

Cancer Advances Inc.	Polyclonal Antibody Stimulator (PAS)		Peptide	Phase III
Corcept Therapeutics Inc.	relacorilant (CORT125134)	Glucocorticoid receptor (GCCR) (NR3C1)	Small molecule	Phase III
Cornerstone Pharmaceuticals Inc.	devimistat (CPI-613, ONO-7912)	Pyruvate dehydrogenase (PDH)	Small molecule	Phase III
FibroGen Inc.	Pamrevlumab (FG-3019)	Connective tissue growth factor (CTGF)	Antibody	Phase III
Jiangsu Hengrui Pharmaceuticals Co. Ltd.	fluzoparib, fuzuloparib (HS10160, SHR3162)	Poly(ADP-ribose) polymerase-1 (PARP-1); Poly(ADP-ribose) polymerase-2 (PARP-2)		Phase III
Merck & Co. Inc.	PEG-IL-10, pegilodecakin (LY3500518, AM0010)	Interleukin-10 (IL-10) receptor (IL10RA)	Protein	Phase III
Morvus Technology Ltd.	Acelarin (MTL-007, NUC-1031)	Not available	Small molecule	Phase III
NanoCarrier Co. Ltd.	Nanoplatin (NC-6004, cisplatin micelles)		Nanoparticle	Phase III
Novartis AG	Afinitor, Certican, Votubia, Zortress, everolimus (RAD001)	Mammalian target of rapamycin (mTOR) (FRAP) (RAFT1)	Small molecule	Phase III
Novocure GmbH	Tumor Treating Fields (TTFields), NovoTTF-100L	Undisclosed	Electromagnetic	Phase III
Phaxiam Therapeutics S.A.	Graspa, eryaspase (ERY-ASP, ERY001)	Undisclosed	Enzyme	Phase III
Pola Pharma Inc.	doranidazole			Phase III
RenovoRx Inc.	RenovoGem	DNA polymerase	Drug/device combination	Phase III
Roche	Xeloda, capecitabine (R340, RG340)	Thymidylate synthetase (TYMS)	Small molecule	Phase III
Shouyao Holdings (Beijing) Co. Ltd.	SY-707	Anaplastic lymphoma kinase (ALK); Focal adhesion kinase (FAK); Insulin-like growth factor-1 (IGF-1)	Undisclosed / Unknown	Phase III
SynCore Biotechnology Co. Ltd.	EndoTAG-1 (SB05, MBT-0206)	Tubulin	Small molecule	Phase III
Takeda Pharmaceutical Co. Ltd.	Glufosfamide	DNA	Small molecule	Phase III
Unicancer Group	mFOLFIRINOX	Not available		Phase III
Wellstat Therapeutics Corp.	Xuriden (Brand), Vistogard (Brand), PN401 (Compound #), vistonuridine (Former), uridine triacetate (Generic), Xuriden (Other), Vistogard (Other)		Small molecule	Phase III
Xoma Corp.	NIS793	Transforming growth factor (TGF) beta 1 (TGFB1)	Antibody	Phase III

Source: Biocentury, June 2024

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