APPENDIX

Appendix 1：方法論
日本で抗菌薬研究に取り組む機関の特定

1．方法

＜ステップ1＞

PubMed に登録されている論文を Antimicrobial Resistance をキイワードに検索。
ヒットした 270,778 件を以下の要件で絞り込む。

- 期間は、2024 年 1 月 1 日から 12 月 31 日の 1 年間。
- Text Availability は Full Text
- Article Language は English
- Species は Human

＜ステップ2＞

著者に日本人が含まれている論文をピックアップし、内容から抗菌薬の研究開発に関連するものを抽出

＜ステップ3＞

First Author 並びに Last Author が所属する日本機関を、抗菌薬研究に取り組む研究機関とする。

＜ステップ4＞

論文内容から新規抗菌薬の研究シードに繋がる研究をピックアップし、その機関を抽出した。

2．結果

ステップ1：8,236 件
ステップ2：154 件
ステップ3：88 件（大学 54 件・研究機関 8 件・病院 26 件）
ステップ4：8 件（福島医科大学・北海道大学・北里大学・京都府立大学・武庫川女子大学・国立医薬品食品衛生研究所・結核予防会結核研究所・山形県立中央病院）

3．考察

2024 年の 1 年間に、日本の研究機関に所属する研究者が著者となっている薬剤耐性に関する論文は 154 報公表されたが、その多くは耐性菌の遺伝子解析等の基礎研究であり、新規抗菌薬の研究シードに繋がる論文は、11 件、取組んでいる研究機関は 8 機関であった（内訳は、大学が 5、研究機関が 2、病院が 1）。この結果からも、日本の抗菌創薬に関する研究が活発でないことが窺える。
ただし、有望な創薬シードについては、特許出願の関係上、論文公表を控えることがあることに留意する必要がある。実際、AMED の創薬総合支援事業（創薬ブースター）で有望とされている藤田医科大学の研究は、今回の検索結果ではピックアップされていない。
また、GARDP（Global Antibiotic Research & Development Partnership）の公表論文には、日本の製薬企業 3 社（エーザイ・武田・第一三共）が協力していた。さらに、公表論文から、微生物のシングルセルゲノム解析技術を用いた受託解析及び共同研究開発を手掛けるスタートアップ企業の bitBiome 株式会社の存在が明らかとなった。製薬企業やスタートアップも抗菌薬領域の研究に取り組んでいないわけではないが、その活動は、やはり活発とは言えないようである。

Appendix 1-1:　Appendix 1 の方法論で抽出された論文リスト

Yellow ＝具体的な新規抗菌薬の創薬シード研究　11 件

1. Antimicrobial resistance patterns of WHO priority pathogens isolated in hospitalized patients in Japan: A tertiary center observational study - PubMed
2. Trends, patterns and relationship of antimicrobial use and resistance in bacterial isolates tested between 2015-2020 in a national referral hospital of Zambia - PubMed
3. Prevalence of streptomycin and tetracycline resistance and increased transmissible third-generation cephalosporin resistance in Salmonella enterica isolates derived from food handlers in Japan from 2006 to 2021 - PubMed
4. Efflux pump inhibitor, phenylalanine-arginine beta-naphthylamide analog potentiates the activity of 5-O-mycaminosyltylonolide for multi-drug resistant Pseudomonas aeruginosa - PubMed ①
5. Rapid discrimination methods for clinical and environmental strains of Aeromonas hydrophila and A. veronii biovar sobria using the N-terminal sequence of the flaA gene and investigation of antimicrobial resistance - PubMed
6. Antimicrobial resistance in hypermucoviscous and non-hypermucoviscous Klebsiella pneumoniae: a systematic review and meta-analysis - PubMed
7. Identification of four genes responsible for antimicrobial resistance of MEL-B against S. aureus - PubMed
8. Antimicrobial-resistant Helicobacter pylori in Japan: Report of nationwide surveillance for 2018-2020 - PubMed
9. Clinical and microbiological characteristics of high-level daptomycin-resistant Corynebacterium species: A systematic scoping review - PubMed
10. Prevalence and antimicrobial resistance of three clones (ST1223, ST2198, ST2250) of Staphylococcus argenteus clinical isolates in northern Japan - PubMed
11. Detection and genetic characterization of multidrug-resistant staphylococci isolated from public areas in an international airport - PubMed
12. Effect of WQ-3334 on Campylobacter jejuni carrying a DNA gyrase with dominant amino acid substitutions conferring quinolone resistance - PubMed ②
13. The emergence of metronidazole-resistant Prevotella bivia harboring nimK gene in Japan - PubMed
14. Antimicrobial resistance and AmpC production in ESBL-producing Klebsiella pneumoniae and Klebsiella quasipneumoniae: A retrospective study in Japanese clinical isolates - PubMed
15. Human Keratinocyte Entry of Noninvasive Streptococcus dysgalactiae Subsp. equisimilis from Humans and Companion Animals: Relatedness with Lancefield Group, Source, Virulence-Associated Genes, and Antimicrobial Resistance Phenotype - PubMed
16. Genomic characterization of Haemophilus influenzae harbouring an exogenous resistance gene - PubMed
17. In vitro activity of cefiderocol against carbapenemase-producing and meropenem-non-susceptible Gram-negative bacteria collected in the Japan Antimicrobial Resistant Bacterial Surveillance - PubMed
18. Genetic characterization of KHM-1 metallo- β -lactamase-producing Enterobacterales isolates from inpatient sources in Osaka, Japan - PubMed

19. Genomic epidemiology and genetic characteristics of clinical Campylobacter species cocirculating in West Bengal, India, 2019, using whole genome analysis - PubMed
20. Genomic analysis of Salmonella isolated from canal water in Bangkok, Thailand - PubMed
21. Enhanced automated detection of outbreaks of a rare antimicrobial-resistant bacterial species - PubMed
22. WQ-3810, a fluoroquinolone with difluoropyridine derivative as the R1 group exerts high potency against quinolone-resistant Campylobacter jejuni - PubMed ③
23. Synergistic effects of novel penicillin-binding protein 1A amino acid substitutions contribute to high-level amoxicillin resistance of Helicobacter pylori - PubMed
24. First detection of VEB-1 extended-spectrum β-lactamase-producing Escherichia coli clinical isolate in Japan - PubMed
25. Culture-based bacterial evaluation of the appendix lumen and antibiotic susceptibility of acute appendicitis in Japan: A single-center retrospective analysis - PubMed
26. Molecular and phenotypic characterization of Streptococcus pneumoniae isolates in a Japanese tertiary care hospital - PubMed
27. Emergence of Quinolone Low-Susceptible Haemophilus influenzae Harboring the Mutated Quinolone Targeting Gene of Haemophilus haemolyticus - PubMed
28. Persistence of Marine Bacterial Plasmid in the House Fly (Musca domestica): Marine-Derived Antimicrobial Resistance Genes Have a Chance of Invading the Human Environment - PubMed
29. High-throughput screening of small-molecules libraries identified antibacterials against clinically relevant multidrug-resistant A. baumannii and K. pneumoniae - PubMed ④
30. Nationwide genome surveillance of carbapenem-resistant Pseudomonas aeruginosa in Japan - PubMed
31. Decubitus ulcer infection and bacteremia due to tazobactam/piperacillin-resistant Veillonella parvula - PubMed
32. Development of treatment strategies by comparing the minimum inhibitory concentrations and minimum fungicidal concentrations of azole drugs in dermatophytes - PubMed
33. Phage cocktail amikacin combination as a potential therapy for bacteremia associated with carbapenemase producing colistin resistant Klebsiella pneumoniae - PubMed ⑤
34. Antimicrobial use and combination of resistance phenotypes in bacteraemic Escherichia coli in primary care: a study based on Japanese national data in 2018 - PubMed
35. Prevalence, genetic characteristics, and antimicrobial resistance of staphylococcal isolates from oral cavity and skin surface of healthy individuals in northern Japan - PubMed
36. Affinity of β-Lactam Antibiotics for Neisseria gonorrhoeae Penicillin-Binding Protein 2 Having Wild, Cefixime-Reduced-Susceptible, and Cephalosporin (Ceftriaxone)-Resistant penA Alleles - PubMed
37. The Association between Transformation Ability and Antimicrobial Resistant Potential in Haemophilus influenzae - PubMed
38. Intrinsic clarithromycin heteroresistance in Mycobacterium avium - PubMed
39. Drug resistance of Pseudomonas aeruginosa based on the isolation sites and types of gastrointestinal diseases: An observational study - PubMed
40. Evaluation of antimicrobial selective pressure using the multicenter semiautomatic surveillance system Japan surveillance for infection prevention and healthcare epidemiology - PubMed

41. Minocycline is a promising candidate as a combination therapy with caspofungin for drug-resistant Candida - PubMed
42. Detection of imported clinical strain of blaNDM-1-harbouring ST147 Klebsiella pneumoniae from a Ukrainian immigrant - PubMed
43. A fatal case of peritonitis caused by Dysgonomonas capnocytophagoides harboring the novel metallo-beta-lactamase gene blaDYB-1 - PubMed
44. Escherichia coli with increased aminoglycoside resistance due to an amino acid substitution at position 85 of HemC - PubMed
45. Two cases with extensively drug-resistant Salmonella Typhi infection returning from Pakistan - PubMed
46. No improvement in mortality among critically ill patients with carbapenems as initial empirical therapy and more detection of multi-drug resistant pathogens associated with longer use: a post hoc analysis of a prospective cohort study - PubMed
47. Variability of macrolide-resistant profile in Mycobacterium avium complex pulmonary disease - PubMed
48. SHIN-2 exerts potent activity against VanA-type vancomycin-resistant Enterococcus faecium in vitro by stabilizing the active site loop of serine hydroxymethyltransferase - PubMed
49. Genomic analysis of extensively drug-resistant Acinetobacter baumannii harbouring a conjugative plasmid containing aminoglycoside resistance transposon TnaphA6 - PubMed
50. Clinical and genomic characteristics of IMP-producing Enterobacter cloacae complex and Klebsiella pneumoniae - PubMed
51. TAC1b mutation in Candida auris decreases manogepix susceptibility owing to increased CDR1 expression - PubMed
52. Development of a rapid detection method for the macrolide resistance gene in Mycobacterium avium using the amplification refractory mutation system-loop-mediated isothermal amplification method - PubMed
53. Genetic Mutations in FKS1 Gene Associated with Acquired Echinocandin Resistance in Candida parapsilosis Complex - PubMed
54. A single amplified genome catalog reveals the dynamics of mobilome and resistome in the human microbiome - PubMed
55. Whole-Genome Sequencing Predicting Phenotypic Antitubercular Drug Resistance: Meta-analysis - PubMed
56. First Detection of Chimeric β -Lactamase CTX-M-64-Producing Salmonella Typhimurium from a Domestic Source in Japan - PubMed
57. A Mother and Daughter with Tinea Corporis Caused by Microsporum canis Apparently Transmitted from a Domestic Cat - PubMed
58. Emergence of drug-resistant Elizabethkingia anophelis clinical isolates in Myanmar - PubMed
59. Molecular characterization of methicillin-susceptible/resistant Staphylococcus aureus from bloodstream infections in northern Japan: The dominance of CC1-MRSA-IV, the emergence of human-associated ST398 and livestock-associated CC20 and CC97 MSSA - PubMed
60. Plasmid-mediated acquisition and chromosomal integration of blaCTX-M-14 in a subclade of Escherichia coli ST131- H 30 clade C1 - PubMed
61. Case of tinea corporis caused by a terbinafine-sensitive Trichophyton indotineae strain in a Vietnamese worker in Japan - PubMed
62. Two cases of iatrogenic levofloxacin-resistant pre-XDR tuberculosis in Japan - PubMed

63. Effective biofilm eradication in MRSA isolates with aminoglycoside-modifying enzyme genes using high-concentration and prolonged gentamicin treatment - PubMed
64. Molecular epidemiology of multidrug-resistant Acinetobacter baumannii isolates from a hospital in Nepal - PubMed
65. The potentiation activity of β -lactam by phomoidrides and oxasetin against methicillin-resistant Staphylococcus aureus - PubMed ⑥
66. Fluoroquinolone resistance and clinical characteristics of acute bacterial prostatitis in Japan: A multicenter study by the Japanese research group for urinary tract infection - PubMed
67. Impact of Antimicrobial-Resistant Bacterial and Polymicrobial Infection on Wound Healing After Minor Forefoot Amputation in Chronic Limb-Threatening Ischemia With Infection - PubMed
68. Efficacy of Cefiderocol, a Novel Siderophore Cephalosporin, against Multidrug Resistant Acinetobacter baumannii Clinical Isolates in Japan - PubMed
69. Evidence of Helicobacter pylori heterogeneity in human stomachs by susceptibility testing and characterization of mutations in drug-resistant isolates - PubMed
70. Multidrug-resistant Klebsiella pneumoniae clinical isolates producing NDM- and OXA-type carbapenemase in Nepal - PubMed
71. Efficacy and side-effect profile of tedizolid in the treatment of streptococcal toxic shock syndrome due to clindamycin-resistant Streptococcus pyogenes: A case report - PubMed
72. Antibiotic susceptibility and genome analysis of Enterococcus species isolated from inpatients in one hospital with no apparent outbreak of vancomycin-resistant Enterococcus in Japan - PubMed
73. Accurate evaluation of pediatric Helicobacter pylori heteroresistance contributes to further improving the quality of tailored therapy - PubMed
74. Relationship Between Fluoroquinolone Resistance and Mutations in the Quinolone Resistance-Determining Region in Corynebacterium macginleyi - PubMed
75. The two-component regulatory systems GraRS and SrrAB mediate Staphylococcus aureus susceptibility to Pep5 produced by clinical isolate of Staphylococcus epidermidis - PubMed
76. Therapeutic drug monitoring of azole antifungal agents - PubMed
77. Selection and evaluation of suitable quality control strains for meropenem antimicrobial susceptibility testing through preliminary external quality assessment - PubMed
78. AI-driven visualization tool for analyzing data and predicting drug-resistant outbreaks - PubMed
79. Revolution of Helicobacter pylori treatment - PubMed
80. Inactivation of antibiotic-resistant bacteria in hospital wastewater by ozone-based advanced water treatment processes - PubMed
81. Uncovering Endolysins against Methicillin-Resistant Staphylococcus aureus Using a Microbial Single-Cell Genome Database - PubMed
82. Exploring the effects of antimicrobial treatment on the gut and oral microbiomes and resistomes from elderly long-term care facility residents via shotgun DNA sequencing - PubMed
83. Commensal consortia decolonize Enterobacteriaceae via ecological control - PubMed
84. Enrichment culture evaluation and characterization of Streptococcus agalactiae among pregnant women in Japan - PubMed

85. Antimicrobial Activity of Positively Charged Oligopeptides with Theoretical High α -Helix Content against Cutibacterium acnes - PubMed ⑦
86. Navigating antibiotic therapy in acute cholangitis: Best practices and new insights - PubMed
87. Transmission of global clones of NDM-producing Enterobacterales and interspecies spread of IncX3 plasmid harbouring blaNDM-5 in Tokyo - PubMed
88. Genomic surveillance of antimicrobial-resistant Escherichia coli in fecal sludge and sewage in Uganda - PubMed
89. Impact of mixed-infection rate of clarithromycin-susceptible and clarithromycin-resistant Helicobacter pylori strains on the success rate of clarithromycin-based eradication treatment - PubMed
90. Significance of early diagnosis and surgical management in treating Mycobacterium immunogenum-related pyogenic extensor tenosynovitis: a case report - PubMed
91. Mycobacterium tuberculosis is less likely to acquire pathogenic mutations during latent infection than during active disease - PubMed
92. Genomic analysis of inter-hospital transmission of vancomycin-resistant Enterococcus faecium sequence type 80 isolated during an outbreak in Hiroshima, Japan - PubMed
93. Far-ultraviolet irradiation at 222 nm destroys and sterilizes the biofilms formed by periodontitis pathogens - PubMed
94. Evaluation of predictors of third-generation cephalosporin non-susceptibility and factors affecting recurrence or death in bacteremia caused by Citrobacter freundii complex , Enterobacter cloacae complex, and Klebsiella aerogenes - PubMed
95. Bacteriological characteristics and changes of Streptococcus pneumoniae serotype 35B after vaccine implementation in Japan - PubMed
96. Amoxicillin vs third-generation cephalosporin for infection prophylaxis after third molar extraction - PubMed
97. Efficacy and safety of long-term macrolide therapy for non-cystic fibrosis bronchiectasis: A systematic review and meta-analysis - PubMed
98. Treatment strategy for older patients with pneumonia independent of the risk of drug resistance in the world's top country for longevity - PubMed
99. Feasibility of Narrow-Spectrum Antimicrobial Agents for Post-Operative Intra-Abdominal Infections After Gastrectomy - PubMed
100. Mobile class A β -lactamase gene bla GMA-1 - PubMed
101. Carbapenem vs. non-carbapenem antibiotics for ventilator-associated pneumonia: A systematic review with meta-analysis - PubMed
102. Effective Management of Methicillin-Resistant Shoulder Septic Arthritis Using Continuous Local Antibiotic Perfusion: A Case Study and Long-Term Follow-Up - PubMed
103. Time from Admission to the Onset of Methicillin-Resistant Staphylococcus aureus Bacteremia in a Single Acute Care Hospital in Japan - PubMed
104. Switch to amoxicillin-clavulanate oral therapy in urinary tract infection caused by extended-spectrum beta-lactamase-producing Escherichia coli: Assessment by chronic phase technetium-99m dimercaptosuccinic acid renal scintigraphy images - PubMed
105. A case of bacteremia caused by Dialister micraerophilus with Enterocloster clostridioformis and Eggerthella lenta in a patient with pyometra - PubMed
106. The importance of meropenem resistance, rather than imipenem resistance, in defining carbapenem-resistant Enterobacterales for public health surveillance: an analysis of national

population-based surveillance - PubMed
107. Reassessment of the relevance between microbiological macrolide-induced resistance and diagnosis and treatment outcome of Mycobacterium abscessus-related pulmonary disease - PubMed
108. Comparison of the effects of cefmetazole and meropenem on microbiome: A pilot study - PubMed
109. Efficacy of carbapenems and alternative antimicrobials for treating complicated urinary tract infections caused by third-generation cephalosporin-resistant gram-negative bacteria: A systematic review and meta-analysis of randomised controlled trials - PubMed
110. Genomic Epidemiology of Pseudomonas aeruginosa Sequence Type 111 - PubMed
111. Bacterial profiles detected in ventilator-associated pneumonia in Japan: A systematic review - PubMed
112. Optimized Antifungal Therapy for Chronic Pulmonary Aspergillosis - PubMed
Analysis of toxin-producing and antiseptic resistance genes of methicillin-resistant Staphylococcus aureus isolated from patients in a neonatal intensive care unit - PubMed
113. Metabolic remodeling by RNA polymerase gene mutations is associated with reduced β-lactam susceptibility in oxacillin-susceptible MRSA - PubMed
114. Genetic characteristics of invasive pneumococcal disease-derived Streptococcus pneumoniae of serogroup 24 isolated in Tokyo, Japan - PubMed
115. Comparison of disease and economic burden between MRSA infection and MRSA colonization in a university hospital: a retrospective data integration study - PubMed
116. Evaluation of Klebsiella pneumoniae pathogenicity through holistic gene content analysis - PubMed
117. Metagenomic gut microbiome analysis of Japanese patients with multiple chemical sensitivity/idiopathic environmental intolerance - PubMed
118. Photodynamic disruption of a polymicrobial biofilm of two periodontal species using indocyanine green-loaded nanospheres - PubMed
119. Terbinafine-resistant tinea pedis and tinea unguium in Japanese military personnel - PubMed
120. Selective bacteriophages reduce the emergence of resistant bacteria in bacteriophage-antibiotic combination therapy - PubMed
121. Effects of coronavirus disease 2019 on the spread of respiratory-transmitted human-to-human bacteria - PubMed
122. Comparative effectiveness of cefmetazole versus carbapenems and piperacillin/tazobactam as initial therapy for bacteremic acute cholangitis: A retrospective study - PubMed
123. Emergence and genetic characterization of KLUC-3 extended-spectrum β-lactamase-producing Escherichia coli ST95 High-Risk clone causing nosocomial infection in Japan - PubMed
124. Cumulative incidence of vancomycin-resistant Enterococcus faecium detection by patient characteristics or possible exposures: prioritization of patients for active screening culture - PubMed
125. Introduction of Spontaneous Mutations Using Streptomycin as a Method for Lactic Acid Bacteria Breeding - PubMed
126. Association of CovRS Two-Component Regulatory System with NADase Induction by

Clindamycin Treatment in Streptococcus pyogenes - PubMed

127. Mobile genetic element-driven genomic changes in a community-associated methicillin-resistant Staphylococcus aureus clone during its transmission in a regional community outbreak in Japan - PubMed
128. Levofloxacin susceptibility of Staphylococci from conjunctiva in patients with atopic dermatitis - PubMed
129. New multilocus sequence typing scheme for Enterococcus faecium reveals sequential outbreaks of vancomycin-resistant E. faecium ST1162 and ST610 in a Japanese tertiary medical center - PubMed
130. An enterococcal phage-derived enzyme suppresses graft-versus-host disease - PubMed
131. Genomic characterization of Staphylococcus aureus isolated from patients admitted to intensive care units of a tertiary care hospital: epidemiological risk of nasal carriage of virulent clone during admission - PubMed
132. Oral and rectal colonization of methicillin-resistant Staphylococcus aureus in long-term care facility residents and their association with clinical status - PubMed
133. Complete sequence of carbapenem-resistant Ralstonia mannitolilytica clinical isolate co-producing novel class D β -lactamase OXA-1176 and OXA-1177 in Japan - PubMed
134. A novel 12-membered ring non-antibiotic macrolide EM982 attenuates cytokine production by inhibiting IKK β and I κ B α phosphorylation - PubMed
135. Innovative peptide architectures: advancements in foldamers and stapled peptides for drug discovery - PubMed ⑧
136. Structural insights into the molecular mechanism of high-level ceftazidime-avibactam resistance conferred by CMY-185 - PubMed
137. Triterpenoid saponin from Panax ginseng increases the sensitivity of methicillin-resistant Staphylococcus aureus to β -lactam and aminoglycoside antibiotics - PubMed ⑨
138. Molecular characterization of a novel putative pathogen, Streptococcus nakanoensis sp. nov., isolated from sputum culture - PubMed
139. In vitro activity of tedizolid against 43 species of Nocardia species - PubMed ⑩
140. In vitro effects of the new oral β -lactamase inhibitor xeruborbactam in combination with oral β -lactams against clinical Mycobacterium abscessus isolates - PubMed ⑪
141. Revealing the role of early peripancreatic bacterial contamination and Enterococcus faecalis in pancreatic fistula development after pancreaticoduodenectomy: Implications for useful antibiotic prophylaxis-An observational cohort study - PubMed
142. Clinical characteristics and antimicrobial susceptibility of Fusobacterium species isolated over 10 years at a Japanese university hospital - PubMed

143. Comprehensive analysis of Mycobacterium tuberculosis genomes reveals genetic variations in bacterial virulence - PubMed
144. Comparing minimum inhibitory concentrations of amikacin for pulmonary Mycobacterium avium complex disease: An analysis of culture media differences - PubMed
145. Ultrasensitive malaria detection system for Anopheles mosquito field surveillance using droplet digital PCR - PubMed
146. Shotgun metagenomic analysis of saliva microbiome suggests Mogibacterium as a factor associated with chronic bacterial osteomyelitis - PubMed
147. Benefits and Harms of Procalcitonin- or C-Reactive Protein-Guided Antimicrobial

Discontinuation in Critically Ill Adults With Sepsis: A Systematic Review and Network Meta-Analysis - PubMed
148. Functional genomic analysis of the isolated potential probiotic Lactobacillus delbrueckii subsp. indicus TY-11 and its comparison with other Lactobacillus delbrueckii strains - PubMed
149. Yogurt starter strains ameliorate intestinal barrier dysfunction via activating AMPK in Caco-2 cells - PubMed
150. Coordination of prophage and global regulator leads to high enterotoxin production in staphylococcal food poisoning-associated lineage - PubMed
151. Severe co-infection caused by difficult-to-diagnose hypermucoviscous Klebsiella pneumoniae K1-ST82 in a patient with COVID-19: a case report - PubMed
152. Micafungin-breakthrough Coniochaeta hoffmannii (Lecythophora hoffmannii) fungemia following cord blood transplant in a patient with acute myeloid leukemia successfully treated with voriconazole - PubMed
153. Genomic analysis and identification of a novel superantigen, SargEY, in Staphylococcus argenteus isolated from atopic dermatitis lesions - PubMed

Appendix 1-2: 研究機関リスト

Appendix1 方法論で選出された論文の第 1、最終執筆者の所属機関名リスト

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
1	Department of Periodontology, School of Dentistry	Aichi Gakuin University,	1				1
2	Department of Clinical Infectious Diseases	Aichi Medical University	2				1
3	Department of Infectious Diseases	Aso Iizuka Hospital,			1		1
4	Division of Clinical Research, Medical Mycology Research Center	Chiba University	3				2
	Department of Infectious Diseases, Medical Mycology Research Center	Chiba University					
5	Division of Infectious Diseases	Chiba Children's Hospital			2		1
6	Department of Pediatrics	Dokkyo Medical University	4				1
7	**Center for Marine Environmental Studies**	**Ehime University,**	5				1
8	Department of Microbiology	Fujita Health University School of Medicine	6				4
	Department of Infectious Diseases	Fujita Health University School of Medicine					
	Department of Microbiology	Fujita Health University School of Medicine					
	Department of Microbiology	Fujita Health University School of Medicine					
9	Department of Clinical Laboratory Sciences, School of Health Sciences	Fukushima Medical University	7			1	1
10	**Department of Bacteriology**	**Gunma University Graduate School of Medicine**	8				1
11	**Graduate School of Health Sciences**	**Hirosaki University**	9				3
	Department of Gastroenterological Surgery,	Hirosaki University Graduate School of Medicine					
	Hirosaki University Graduate School of Medicine						
12	**Graduate School of Integrated Sciences for Life**	**Hiroshima University**	10				14
	Department of Microbiology, Graduate School of Biomedical and Health Sciences	**Hiroshima University**					
	Department of Emergency and Critical Care Medicine, Graduate School of Biomedical and Health Sciences	**Hiroshima University**					
	Department of Oral and Maxillofacial Surgery	Hiroshima University Graduate School of Biomedical and Health Sciences					
	Department of Bacteriology	Hiroshima University Graduate School of Biomedical and Health Sciences					
	Department of Bacteriology	Hiroshima University Graduate School of Biomedical and Health Sciences					
	Department of Emergency and Critical Care Medicine, Graduate School of Biomedical & Health Sciences	Hiroshima University					
	Department of Emergency and Critical Care Medicine, Graduate School of Biomedical & Health Sciences	Hiroshima University					
	Department of Emergency and Critical Care Medicine, Graduate School of Biomedical and Health Sciences,	Hiroshima University,					
	Department of Pediatric Dentistry, Graduate School of Biomedical and Health Sciences	Hiroshima University,					
	Department of Bacteriology	Hiroshima University,					
	Department of Antimicrobial Resistance,	Hiroshima University Graduate School of Biomedical and Health Sciences					
	Department of Bacteriology	Hiroshima University Graduate School of Biomedical & Health Sciences					
	Department of Bacteriology	Graduate School of Biomedical and Health Sciences					
13	Department of Infectious Diseases	Hiroshima University Hospital,			3		1

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
14	Hokudai Center for Zoonosis Control in Zambia	Hokkaido University	11			2	6
	Division of Bioresources	Hokkaido University International Institute for Zoonosis Control,					
	Division of Bioresources	Hokkaido University International Institute for Zoonosis Control,					
	Division of Bioresources	Hokkaido University International Institute for Zoonosis Control,					
	Division of Bioresources	Hokkaido University International Institute for Zoonosis Control					
	Division of Pediatric Dentistry, Department of Oral Growth and Development, School of Dentistry	Health Sciences University of Hokkaido					
15	Department of Urology	Hyogo College of Medicine	12				1
16	School of Medicine	International University of Health and Welfare	13				2
	Department of Medical Laboratory Sciences, Health, and Sciences	International University of Health and Welfare					
17	Department of Infectious Diseases	Japanese Red Cross Narita Hospital			4		2
	Department of Emergency Medicine and Department of Infectious Diseases	Japanese Red Cross Narita Hospital					
18	Division of Bacteriology, Department of Infection and Immunity	Jichi Medical University	14				1
19	Department of Microbiology	Juntendo University School and Graduate School of Medicine	15				5
	Department of Dermatology	Juntendo University School of Medicine					
	Department of Microbiology	Juntendo University Graduate School of Medicine					
	Department of Microbiology	Juntendo University School of Medicine					
	Department of Clinical Laboratory Medicine	Juntendo University Graduate School of Medicine,					
20	Department of Emergency and Critical Care Medicine	Juntendo University Urayasu Hospital,			5		1
21	Department of Infectious Diseases	Kagawa Prefectural Central Hospital			6		1
22	Department of Clinical Laboratory	Kameda Medical Center			7		1
23	Department of Dermatology	Kanazawa Medical University	16				2
	Department of Orthopaedic Surgery	Kanazawa Medical University					
24	Department of Pharmacy	Kariya Toyota General Hospital			8		1
25	Department of Microbiology and Immunology	Keio University School of Medicine	17				2
	Division of Pulmonary Medicine, Department of Medicine	Keio University School of Medicine					
26	Graduate School of Infection Control Sciences	Kitasato University	18			3	4
	Ōmura Satoshi Memorial Institute	Kitasato University					
	Laboratory of Infectious Diseases, Graduate School of Infection Control Sciences & Ōmura Satoshi Memorial Institute	Kitasato University					
	Graduate School of Infection Control Sciences	Kitasato University					
27	Department of Pharmacy	Kochi Medical School Hospital			9		2
	Department of Pharmacy	Kochi Medical School Hospital					
28	Department of Pharmacy, Tazuke Kofukai Medical Research Institute	Kitano Hospital			10		1
29	Laboratory of Clinical Pharmacoepidemiology	Kyoto Pharmaceutical University	19				1
30	Department of Pharmacy, University Hospital	Kyoto Prefectural University of Medicine	20			4	2
	Food Hygiene and Environmental Health, Division of Applied Life Science, Graduate School of Life and Environmental Sciences	Kyoto Prefectural University of Medicine					
31	Department of Environmental Engineering, Graduate School of Engineering	Kyoto University	21				5
	Graduate School of Asian and African Area Studies	Kyoto University					
	Division of Gastrointestinal Surgery, Department of Surgery	Kyoto University					
		Kyoto University Graduate School of Medicine					
	Department of Laboratory Medicine, Graduate School of Medicine and Faculty of Medicine	Kyoto University					
32	Department of Ophthalmology	Kyorin University School of Medicine,	22				1
33	Department of Ophthalmology	Kurume University School of Medicine	23				1

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
34	Department of Health Care Administration and Management	Kyushu University Graduate School of Medical Sciences	24				2
	Department of Bacteriology, Graduate School of Medical Sciences	Kyushu University					
35	**Department of Microbiology, Faculty of Pharmacy**	**Meijo University**	25				6
	Department of Microbiology, Faculty of Pharmacy	**Meijo University**					
	Department of Microbiology, Faculty of Pharmacy,	**Meijo University**					
	Department of Microbiology, Faculty of Pharmacy	**Meijo University**					
	Division of Pharmaceutical Sciences I, Faculty of Pharmacy	Meijo University					
	Department of Microbiology, Faculty of Pharmacy	Meijo University					
36	Department of Clinical Pharmaceutics, Faculty of Pharmaceutical Sciences	Mukogawa Women's University	26			5	1
37	Faculty of Data Science	Musashino University	27				1
38	**Department of Laboratory Medicine**	**Nagasaki University Graduate School of Biomedical Sciences**	28				4
	Department of Pharmacotherapeutics	Nagasaki University Graduate School of Biomedical Sciences					
	Department of Respiratory Medicine	Nagasaki University Hospital					
	Department of Respiratory Medicine	Nagasaki University Graduate School of Biomedical Sciences					
39	**Department of Infectious Diseases**	**Nagoya University Hospital**			11		2
	Department of Infectious Diseases	Nagoya University Hospital,					
40	Department of Integrated Health Sciences	Nagoya University Graduate School of Medicine	29				2
	Department of Bacteriology/Drug Resistance and Pathogenesis	Nagoya University, Graduate School of Medicine					
41	Department of Bacteriology	Nagoya City University Graduate School of Medical Sciences,	30				1
42	**AMR Clinical Reference Center**	National Center for Global Health and Medicine		1			5
	Disease Control and Prevention Center	National Center for Global Health and Medicine					
	Disease Control and Prevention Center	National Center for Global Health and Medicine					
	Genome Medical Science Project	National Center for Global Health and Medicine					
	Disease Control and Prevention Center	National Center for Global Health and Medicine					
43	Department of Surgery	National Defense Medical College	31				2
	Department of Dermatology	National Defense Medical College					
44	DNA Data Analysis Laboratory, Department of Genomics and Evolutionary Biology	National Institute of Genetics		2			1
45	Division of Organic Chemistry	National Institute of Health Sciences		3		6	1

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
46	**Antimicrobial Resistance Research Centre**	**National Institute of Infectious Diseases**		4			19
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	**National Institute of Infectious Diseases,**					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Field Epidemiology Training Program, Infectious Diseases Surveillance Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Cente	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Therapeutic Drugs and Vaccine Development Research Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Department of Parasitology	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
	Antimicrobial Resistance Research Center	National Institute of Infectious Diseases					
47	Department of Internal Medicine	NHO Awara National Hospital			12		1
48	Department of Gastroenterology	NHO Hakodate National Hospital			13		1
49	Clinical Research Center	NHO Kinki Chuo Chest Medical Center			14		1
50	Department of Respiratory Medicine and Infectious Diseases,	Niigata University Graduate School of Medical and Dental Science	32				1
51	**Department of Gastroenterology, Faculty of Medicine**	**Oita University**	33				5
	Department of Environmental and Preventive Medicine, Faculty of Medicine	**Oita University**					
	Department of Environmental and Preventive Medicine	Oita University Faculty of Medicine					
	Respiratory Medicine and Infectious Diseases	Oita University Faculty of Medicine					
	Respiratory Medicine and Infectious Diseases	Oita University Faculty of Medicine					
52	**Department of Bacteriology**	**Okayama University Graduate School of Medicine**	34				2
	Department of Bacteriology	Okayama University Graduate School of Medicine					
53	**Division of Microbiology, Bacteriology Section**	**Osaka Institute of Public Health**		5			1
54	Department of Pharmacy	Osaka Medical and Pharmaceutical University	35				1
55	**Department of Medical Education and General Practice, Graduate School of Medicine**	**Osaka Metropolitan University**	36				3
	Department of Infection Control Science	**Osaka Metropolitan University Graduate School of Medicine,**					
	Department of Immunology and Genomics, Graduate School of Medicine	Osaka Metropolitan University					
56	**Department of Global and Innovative Medicine**	**Osaka University Graduate School of Medicine**	37				2
	Department of Clinical Laboratory and Biomedical Sciences, Laboratory of Medical Microbiology and Microbiome, Division of Health Sciences	Osaka University Graduate School of Medicine					
57	Department of Respiratory Medicine, National Hospital Organization	Osaka Toneyama Medical Center			15		1

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
58	Department of Cardiology	Rakuwakai Otowa Hospital			16		1
59	Department of Mycobacterium Reference and Research	Research Institute of Tuberculosis		6		7	3
	Department of Mycobacterium Reference and Research	Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association					
	The Research Institute of Tuberculosis	Japan Anti-Tuberculosis Association					
60	Laboratory for Microbiome Sciences,	**RIKEN Center for Integrative Medical Sciences**		7			1
61	Department of Pediatrics, Faculty of Medicine	Saga University	38				1
62	Department of Clinical Laboratory Medicine	Saitama Medical University	39				1
63	**Department of Hygiene**	**Sapporo Medical University School of Medicine**	40				5
	Department of Hygiene	**Sapporo Medical University School of Medicine**					
	Department of Urology	**Sapporo Medical University School of Medicine**					
	Department of Microbiology	**Sapporo Medical University School of Medicine**					
	Department of Hygiene	Sapporo Medical University School of Medicine					
64	Department of Laboratory Medicine	Shinshu University Hospital			17		1
65	Department of Health and Medical Science	Graduate School of Medicine, Shinshu University	41				3
	Department of Biomolecular Innovation, Institute for Biomedical Sciences,	Shinshu University					
	Department of Biomolecular Innovation, Institute for Biomedical Sciences	Shinshu University					
66	Department of Infection Control,	Shizuoka General Hospital			18		1
67	Faculty of Human Life Sciences	Shokei University	42				1
68	Department of Gastroenterology, Medicine Center	Shonan Kamakura General Hospital			19		2
	Center for Immunology and Allergy	Shonan Kamakura General Hospital					
69	Department of Surgery	**Showa Inan General Hospital**			20		1
70	Division of Infection Control Sciences, Department of Clinical Pharmacy	School of Pharmacy, Showa University,	43				1
71	Global Health Nursing, Graduate School of Nursing Science	St. Luke's International University,	44				1
72		**Teikyo University Institute of Medical Mycology (TIMM),**	45				4
	Department of Microbiology and Immunology	**Teikyo University School of Medicine**					
	Department of Microbiology and Immunology	Teikyo University of Medicine					
		Teikyo University Institute of Medical Mycology (TIMM)					
73	**Division of Clinical Microbiology Laboratory**	**Toho University Ohashi Medical Center**			21		1
74	Department of Respiratory Medicine	Toho University Omori Medical Center			22		1
75	Department of Microbiology and Infectious Disease	Toho University School of Medicine	46				3
	Department of Microbiology and Infectious Diseases	Toho University Graduate School of Medicine					
	Department of Microbiology and Infection Control and Prevention	Toho University Graduate School of Medicine					
76	**International Education and Research Center for Food and Agricultural Immunology, Graduate School of Agricultural Science**	**Tohoku University**	47				4
	Division of Infectious Diseases, International Research Institute of Disaster Science	**Tohoku University**					
	Division of Biomedical Measurements and Diagnostics, Graduate School of Biomedical Engineering	**Tohoku University**					
	Laboratory of Animal Food Function, Graduate School of Agricultural Science	**Tohoku University**					
77	**Department of Dermatology**	**Tokyo Medical University**	48				2
	Department of Microbiology	Tokyo Medical University					
78	**Department of Laboratory Medicine**	**Tokyo Metropolitan Tama Medical Center**			23		1

No.	学部/部門	大学/研究所	大学	研究機関	病院	Drug Discovery	論文数
79	Department of Microbiology	Tokyo Metropolitan Institute of Public Health		8			1
80	Division of Infection Control and Prevention	University of Fukui Hospital	49				1
81	Department of Emergency and Intensive Care Medicine, School of Medicine	University of Occupational and Environmental Health	50				2
	Department of Urology	University of Occupational and Environmental Health					
82	**Laboratory of Microbiology, School of Health Sciences, Faculty of Medicine,**	**University of the Ryukyus**	51				1
83	Department of Infection Control and Prevention	The University of Tokyo Hospital			24		2
	Department of Respiratory Medicine	The University of Tokyo Hospital					
84	Department of Infection Control and Prevention, Graduate School of Medicine	The University of Tokyo	52				3
	Department of Clinical Epidemiology and Health Economics, School of Public Health	The University of Tokyo					
	Department of Human Genetics, School of International Health, Graduate School of Medicine	The University of Tokyo					
85	**Department of Clinical Laboratory**	**Urasoe General Hospital**			25		1
86	Department of Infectious Diseases and Infection Control,	**Yamagata Prefectural Central Hospital,**			26	8	1
87	Faculty of Laboratory Science	Yamaguchi University Graduate School of Medicine,	53				2
	Department of Gastroenterology and Hepatology	Yamaguchi University Graduate School of Medicine,					
88	Department of Pulmonology	Yokohama City University Graduate School of Medicine	54				1
	Total		54	8	26	8	194
				88			
	Global Antibiotic Research and Development Partnership (GARDP)						
	Eisai Co., Ltd						
	Takeda Pharmaceutical Company Ltd						
	Daiichi Sankyo Co., Ltd						
	Drugs for Neglected Diseases Initiative						
	Food Microbiology and Function Research Laboratories, R&D Division, Meiji Co., Ltd,						
	bitBiome, Inc.						
	bitBiome, Inc						

Appendix 2: バイオ分野のスタートアップリスト

	治療薬に取り組む企業名
1	アキュリスファーマ株式会社
2	アクチュアライズ株式会社
3	株式会社アデノプリベント
4	アネキサペップ株式会社
5	アルファフュージョン株式会社
6	アルメッド株式会社
7	株式会社イクスフォレストセラピューティクス
8	イミュニティリサーチ株式会社
9	株式会社イムノロック
10	株式会社イーベック
11	株式会社ウェルセラ
12	エディットフォース株式会社
13	株式会社エヌビィー健康研究所
14	エピトマップ株式会社
15	株式会社エピトープサイエンス
16	エポメッド株式会社
17	エムバイオテック株式会社（感染症領域）
18	遠友ファーマ株式会社
19	株式会社大分大学先端医学研究所
20	株式会社オキシキャリア
21	株式会社オトリンク
22	オプティアム・バイオテクノロジーズ株式会社
23	オリヅルセラピューティクス株式会社
24	オルバイオ株式会社
25	株式会社オーダーメードメディカルリサーチ
26	オーチャード・バイオ株式会社
27	オーピーバイオファクトリー株式会社
28	カノンキュア株式会社
29	カムイファーマ株式会社
30	株式会社ギャップジャンクション
31	株式会社キュアディスク
32	株式会社キュライオ
33	株式会社京都創薬研究所
34	株式会社ギンレイラボ
35	株式会社クオントディテクト

	治療薬に取り組む企業名
36	グリーン・テック株式会社
37	株式会社クロバーナ
38	株式会社ケイファーマ
39	株式会社抗体医学研究所
40	株式会社再生医学研究所
41	サヴィッド・セラピューティックス株式会社
42	サーブ・バイオファーマ株式会社
43	ジェイファーマ株式会社
44	株式会社ジェクスヴァル
45	ジェリクル株式会社
46	ジーネックス株式会社
47	株式会社ジーンケア研究所
48	株式会社スコヒアファーマ
49	セルアクシア株式会社
50	セルファクター株式会社
51	セレブロファーマ株式会社
52	株式会社先端免疫療法研究所
53	株式会社創晶
54	ソシウム株式会社
55	タグシクス・バイオ株式会社
56	株式会社タンソーバイオサイエンス
57	東京核酸合成株式会社
58	ときわバイオ株式会社
59	トレジェムバイオファーマ株式会社
60	株式会社ナティアス
61	株式会社ナノエッグ
62	株式会社ニュージェン・ファーマ
63	株式会社ニュージェン・ファーマ
64	株式会社バイオジップコード
65	株式会社バイオパレット（細菌感染症領域）
66	株式会社バッカス・バイオイノベーション
67	バーミリオン・セラピューティックス株式会社
68	ひむかAMファーマ株式会社
69	株式会社ビークル
70	ファイメクス株式会社

	治療薬に取り組む企業名
71	ファスタイド株式会社
72	株式会社ファルネックス
73	ファーメランタ株式会社
74	株式会社フェリクス
75	プラチナバイオ株式会社
76	株式会社ブレイゾン・セラピューティクス
77	ペリオセラピア株式会社
78	マイキャン・テクノロジーズ株式会社
79	ミラックスセラピューティクス株式会社
80	ミラバイオロジクス株式会社
81	メスキュージェナシス株式会社
82	メタジェンセラピューティクス株式会社
83	モジュラス株式会社
84	モルミル株式会社
85	ユナイテッド・イミュニティ株式会社
86	ユビエンス株式会社
87	ライラックファーマ株式会社
88	リジェネフォーティー株式会社
89	リジェネフロ株式会社
90	リバーセル株式会社
91	リベロセラ株式会社
92	株式会社リボルナバイオサイエンス
93	株式会社リンクバイオ
94	リンクメッド株式会社
95	株式会社凜研究所
96	リードファーマ株式会社
97	ルカ・サイエンス株式会社
98	ルクサナバイオテク株式会社
99	株式会社レクメド
100	株式会社レボルカ
101	日本抗体医薬株式会社
102	株式会社aceRNA Technologies
103	aiwell株式会社
104	AlphaNavi Pharma株式会社
105	株式会社AskAt

	治療薬に取り組む企業名
106	株式会社AutoPhagyGO
107	B-MED株式会社
108	合同会社BeCellBar
109	BFACT株式会社
110	bitBiome株式会社（感染症領域）
111	BRIファーマ株式会社
112	株式会社BTB創薬研究センター
113	株式会社C-HASプラス
114	C4U株式会社
115	cBioinformatics株式会社
116	Chordia Therapeutics株式会社
117	株式会社COGNANO
118	Crafton Biotechnology株式会社
119	CrestecBio株式会社
120	株式会社CUBICStars
121	株式会社Elix
122	株式会社Elixir Pharma
123	株式会社Epsilon Molecular Engineering
124	Eurus Therapeutics株式会社
125	株式会社EVAセラピューティクス
126	株式会社EXORPHIA
127	株式会社FerroptoCure
128	株式会社FREST
129	株式会社GenAhead Bio
130	株式会社HikariQ Health
131	HiLung株式会社
132	HISHOH Biopharma株式会社
133	株式会社HOIST
134	HILO株式会社
135	株式会社Hyperion Drug Discovery
136	iBody株式会社
137	株式会社Immunohelix
138	iSiP株式会社
139	JOCAVIO株式会社
140	株式会社mAbProtein

	治療薬に取り組む企業名
141	株式会社Maqsys
142	株式会社MOLCURE
143	Noster株式会社（感染症領域）
144	NOVIGO Pharma株式会社
145	PRD Therapeutics株式会社
146	株式会社PRISM BioLab
147	株式会社Qイノベーション
148	Red Arrow Therapeutics株式会社
149	株式会社ReguGene
150	RePHAGEN株式会社（細菌感染症領域）
151	株式会社S＆Kバイオファーマ
152	SBIバイオテック株式会社

	治療薬に取り組む企業名
153	株式会社SENTAN Pharma
154	STAND Therapeutics株式会社
155	株式会社Stratoimmune
156	Sustainable Cell Therapeutics株式会社
157	TNAX Biopharma株式会社
158	株式会社Triplex Therapeutics
159	Veneno Technologies株式会社
160	株式会社Veritas In Silico
161	CHITOSE BIO EVOLUTION PTE. LTD.
162	KORTUC Inc.
163	シルクストランドファーマ（細菌感染症領域）*

注：・黄色マーカーの企業については次ページ参照。

・＊以外の出典はバイオ・ヘルスケアスタートアップ総覧2023－2024(日経バイオテク)

感染症領域で活動しているバイオ分野のスタートアップリスト

	治療薬に取り組む企業名	URL	事業内容	出典
1	エムバイオテック株式会社（感染症領域）	https://www.mbiotechnology.com/	私たちは、コア技術である「マイコプラズマ脂質抗原」の技術をもとに、診断・予防（ワクチン）・治療（抗体医薬）の分野に挑戦し、この疾患の克服を目指しています。	バイオ・ヘルスケアスタートアップ総覧2023-2024（日経バイオテク）
2	株式会社バイオパレット（細菌感染症領域）	https://www.biopalette.co.jp/pipeline/	ゲノム編集によって育種・改変した細菌を活用してマイクロバイオーム（細菌叢）の制御を実現し、マイクロバイオーム治療における世界のリーディングカンパニーとなることを目指しています。	バイオ・ヘルスケアスタートアップ総覧2023-2024（日経バイオテク）
3	bitBiome株式会社（感染症領域）	https://bitbiome.co.jp/	バイオものづくり関連の共同研究 微生物のシングルセルゲノム解析技術を用いた受託解析及び共同研究開発	バイオ・ヘルスケアスタートアップ総覧2023-2024（日経バイオテク）
4	Noster株式会社（感染症領域）	https://www.noster.inc/jp/products/	腸内細菌とその腸内細菌が産生する「ポストバイオティクス®」による微生物・化合物ライブラリーを構築し、腸内菌叢をターゲットにした革新的治療を実現	バイオ・ヘルスケアスタートアップ総覧2023-2024（日経バイオテク）
5	RePHAGEN株式会社（細菌感染症領域）	https://rephagen.com/phage/	弊社は、自然界から殺菌能力が高く、広範な細菌を殺菌するバクテリオファージを効率よく採集し、分離・単離する技術ノウハウを有しており、沖縄県の自然界から単離したファージのバンク化および多剤耐性菌を殺菌可能なファージ製剤の開発を進めています。	日経バイオテク
6	シルクストランドファーマ（細菌感染症領域）	https://www.smrj.go.jp/incubation/tkv/companylist/fbrion000000f2ly.html	新規抗生物質ライソシンE及び後続の新規薬剤耐性菌感染症治療薬の研究、開発	日経バイオテク

Appendix 3: セクション２の図表の補完的資料

表 2-1_A- 1 ：ヒトに関するアクションプラン（2023-2027）の成果指標
特定の抗菌薬の報告数および耐性率（%）

	2020 年	2021 年	2022 年	2023 年	2027 年（目標値†）
バンコマイシン耐性腸球菌感染症の報告数	136	124	133	-	80 人以下 （2019 年時点に維持）
黄色ブドウ球菌のメチシリン耐性率（血液）*2	35.9	35.1	33.9	32.5	20%以下
大腸菌のフルオロキノロン耐性率（尿）*3	35.4	34.6	34.0	32.8	30%以下（維持）
緑膿菌のカルバペネム（メロペネム）耐性率（血液）*2	7.1	7.0	6.3	5.0	3%以下
大腸菌のカルバペネム（メロペネム）耐性率	0.1	0.1	0.1	0.1	0.2%以下§
肺炎桿菌のカルバペネム（メロペネム）耐性率	0.4	0.4	0.4	0.3	0.2%以下§

*1JANIS データ（一部 AMED 薬剤耐性菌のサーベイランス強化および薬剤耐性菌の総合的な対策推進に関する研究より引用）および感染症発生動向調査事業より作成。

†目標値は、AMR 対策アクションプラン文献 7 より抜粋。2020 年との比較。

*2血流感染症は疾病負荷に大きく寄与し、保菌の影響を除く意図で血液検体とする

*3外来において、薬剤耐性菌が治療に直結する尿路感染症を対象とするため尿検体とする

§AMR 対策アクションプラン（文献 1）には、2014 の大腸菌と肺炎桿菌のカルバペネム耐性率は 0.1%と 0.2%であり、2020 年の耐性率を同水準に維持するとある。

出所：薬剤耐性ワンヘルス動向調査年次報告書 2024

表 2-2_A-2：ヒトに関する薬剤耐性（AMR）対策アクションプラン（2023-2027）の成果指標（ヒト）
抗菌薬使用 (DID)（販売量による検討）

	2020 年	2021 年	2022 年	2023 年	2020 年 との比較	2027 年 （目標値*）
全抗菌薬	10.18	9.77	9.78	11.96	17.4%増	15%減
経口第 3 世代 セファロスポリン系薬	1.85	1.70	1.63	1.94	4.7%増	40%減
経口フルオロキノロン系薬	1.66	1.48	1.52	2.07	25.0%増	30%減
経口マクロライド系薬	2.93	2.72	2.66	3.45	17.7%増	25%減
静注カルバペネム系薬	0.07	0.07	0.07	0.06	6.7%増	20%減

DID: Defined daily dose per 1,000 inhabitants per day　人口 1,000 人あたりの 1 日使用量。

出所：薬剤耐性ワンヘルス動向調査年次報告書 2024

図 2-2_A-3：血流感染症の患者における推定死亡者数

	人（95% CI）*								
	2015	2016	2017	2018	2019	2020	2021	2022	2023
*Staphylococcus aureus**	7,372 (5,721-9,047)	7,935 (6,172-9,725)	8,070 (6,271-9,885)	8,187 (6,361-10,034)	8,732 (6,793-10,693)	7,510 (5,399-9,624)	8,039 (5,776-10,316)	9,528 (7,387-11,620)	10,439 (8,097-12,770)
MRSA	3,608 (2,357-4,873)	3,758 (2,453-5,078)	3,716 (2,428-5,029)	3,690 (2,411-4,979)	3,966 (2,590-5,363)	3,633 (2,516-4,901)	3,917 (2,715-5,288)	3,938 (2,602-5,386)	4,505 (2,952-6,266)
*Streptococcus pneumoniae**	480 (160-879)	430 (144-787)	447 (149-818)	463 (154-846)	410 (137-750)	247 (82-453)	204 (68-374)	198 (66-363)	220 (73-370)
PRSP	126 (42-231)	108 (36-198)	94 (31-173)	113 (38-206)	106 (35-194)	77 (26-141)	74 (25-136)	60 (20-101]	99 (33-168)
*Escherichia coli**	7,130 (5,701-8,643)	7,636 (6,111-9,251)	8,001 (6,404-9,688)	8,154 (6,523-9,890)	8,666 (6,921-10,506)	8,527 (6,829-10,240)	8,713 (6,983-10,481)	8,542 (6,843-10,311)	9,992 (7,937-12,006)
FQREC	2,889 (2,715-3,071)	3,310 (3,113-3,528)	3,376 (3,173-3,591)	3,753 (3,534-3,994)	4,201 (3,955-4,467)	4,118 (3,876-4,394)	4,170 (3,920-4,445)	4,172 (3,930-4,434)	4,827 (4,530-5,145)
3CREC	2,146 (1,155-3,300)	2,252 (1,212-3,462)	2,377 (1,280-3,660)	2,647 (1,425-4,074)	3,009 (1,620-4,625)	2,890 (1,559-4245)	3,028 (1,635-4,445)	2,970 (1,601-4,565)	3,810 (2,048-5,590)
*Klebsiella pneumoniae**	4,167 (3,171-5,276)	4,218 (3,207-5,318)	4,311 (3,275-5,437)	4,561 (3,466-5,755)	4,506 (3,424-5,704)	4,484 (3,405-5,668)	4,529 (3,444-5,727)	4,659 (3,453-5,840)	5,640 (4,268-7,188)
3CRKP	474 (344-608)	492 (359-633)	461 (334-592)	533 (386-685)	530 (385-680)	597 (432-761)	682 (495-870)	762 (572-974)	1,120 (838-1,427)
*Pseudomonas aeruginosa**	2,036 (1,320-2,855)	2,109 (1,369-2,957)	2,074 (1,345-2,909)	2,188 (1,418-3,069)	2,243 (1,455-3,148)	2,139 (1,385-2,996)	2,344 (1,516-3,282)	2,282 (1,373-3,197)	2,598 (1,563-3,637)
CRPA	343 (296-388)	369 (318-418)	303 (263-343)	318 (275-360)	324 (280-367)	344 (297-388)	399 (345-448)	323 (281-366)	294 (257-334)

MRSA; methicillin-resistant *S. aureus*、PRSP; penicillin-resistant *Streptococcus pneumoniae*、FQREC; fluoroquinolone-resistant *E. coli*、3CREC; 3rd generation Cephalosporine-resistant *E. coli*、3CRKP; 3rd generation Cephalosporine-resistant *Klebsiella pneumoniae*、CRPA; Carbapenem-resistant *Pseudomonas aeruginosa*.

†推定死亡者数の算出方法は Tsuzuki らの報告 (Tsuzuki S et al. *IJID* 2021. DOI: 10.1016/j.ijid.2021.05.018) に準じた。JANIS データに基づいて各年の参加施設数の病床数と実際の病床数から菌血症の全数を推定した。これに先行研究から得た微生物ごとの死亡率を乗じて推定死亡者数とした。微生物ごとの菌血症による死亡率は上記文献の補遺(https://www.ijidonline.com/article/S1201-9712(21)00419-7/fulltext#supplementaryMaterial) に記載されている。

**S. aureus* は MRSA、*S. pneumoniae* は PRSP、 *E. coli* は FQREC もしくは 3CREC、（FQREC、3CREC はそれぞれの薬剤に耐性である菌を独立に算出）、*Klebsiella pneumoniae* は 3CRKP、 *Pseudomonas aeruginosa* は CRPA を含んだ集計。括弧内は 95%信頼区間を表す。

出所：薬剤耐性ワンヘルス動向調査年次報告書 2024