

マテリアル先端リサーチインフラ利用報告書

ARIM User's Report

[Release : 2024.07.25] [Update : 2024.03.22]

課題データ / Project Data

課題番号 Project Issue Number	23AT0128
利用課題名 Title	Direct write particles
利用した実施機関 Support Institute	産業技術総合研究所 / AIST
機関外・機関内の利用 External or Internal Use	外部利用/External Use
横断技術領域 Cross-Technology Area	加工・デバイスプロセス/Nanofabrication 計測・分析/Advanced Characterization
重要技術領域 Important Technology Area	次世代バイオマテリアル/Next-generation biomaterials マルチマテリアル化技術・次世代高分子マテリアル/Multi-material technologies / Next-generation high-molecular materials
キーワード Keywords	Microfluidics,電子顕微鏡/ Electronic microscope,生体イメージング/ In vivo imaging,膜加工・エッチング/ Film processing/etching,光リソグラフィ/ Photolithgraphy,異種材料接着・接合技術/ Dissimilar material adhesion/bonding technology

利用者と利用形態 / User and Support Type

利用者名（課題申請者） User Name (Project Applicant)	Utada Andrew Shinichi
所属名 Affiliation	筑波大学
共同利用者氏名 Names of Collaborators in Other Institutes Than Hub and Spoke Institutes	
ARIM実施機関支援担当者 Names of Collaborators in The Hub and Spoke Institutes	杉山 和義,佐藤 平道
利用形態 Support Type	技術補助/Technical Assistance

利用した主な設備 / Equipment Used in This Project

利用した主な設備 Equipment ID & Name	AT-009 : コンタクトマスクアライナー[MJB4] AT-018 : 反応性イオンエッチング装置 (RIE) AT-004 : 電界放出形走査電子顕微鏡[S4800_FE-SEM]
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報告書データ / Report

概要 (目的・用途・実施内容) Abstract (Aim, Use Applications and Contents)	<p>Microfluidics merges micro-scale fluid channels with advanced imaging, enabling real-time observation of bacteria. This technology controls bacterial environments, offering high-resolution imaging for studying microbial behavior, antibiotic resistance, and biofilm formation. It holds promise for biomedical research, diagnostics, and drug development. We aim to design microfluidic imaging chambers to allow for the tracking of growth and development of microbes.</p>
実験 Experimental	<p>We have used the contact mask aligner (Karl Suss) and reactive ion etching (RIE) in our work. We used the mask aligner to form the photo-resist patterns (molds) that are used to mold the polymer polydimethylsiloxane (PDMS). We plan but haven't yet used the RIE to etch glass to form shallow chambers.</p>
結果と考察 Results and Discussion	<p>We have only used the aligner one time this year and our two-layer devices were not successful. We must analyze more carefully why our patterns were not formed. It is possible that our photoresists didn't have sufficient adhesion to the substrate, which ultimately caused them to be washed away during development.</p>
図・表・数式 Figures, Tables and Equations	
その他・特記事項 (参考文献・謝辞等) Remarks(References and Acknowledgements)	

成果発表・成果利用 / Publication and Patents

DOI (論文・プロシーディング) DOI (Publication and Proceedings)	
口頭発表、ポスター発表 おおよび、その他の論文 Oral Presentations etc.	
特許出願件数 Number of Patent Applications	0件
特許登録件数 Number of Registered Patents	0件