

## Review

# Exploring the Pipeline of Novel Therapies for Inflammatory Bowel Disease; State of the Art Review

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**Abstract:** Crohn's disease (CD) and ulcerative colitis (UC), known as inflammatory bowel diseases (IBD), are characterized by chronic inflammation of the gastrointestinal tract. Over the last two decades, numerous medications have been developed and repurposed to induce and maintain remission in IBD patients. Despite the approval of multiple drugs, the major recurring issues continue to be primary non-response and secondary loss of response, as well as short- and long-term adverse events. Most clinical trials show percentages of response under 60%, possibly as a consequence of strict inclusion criteria and definitions of response. That is why these percentages appear to be more optimistic in real-life studies. A therapeutic ceiling has been used as a term to define this invisible bar that has not been crossed by any drug yet. This review highlights novel therapeutic target agents in phases II and III of development, such as sphingosine-1-phosphate receptor modulators, selective Janus kinase inhibitors, anti-interleukins, and other small molecules that are currently under research until 1 January 2023. Emerging treatments for CD and UC that have just received approval or are undergoing phase III clinical trials are also discussed in this review.

**Keywords:** Crohn's disease; ulcerative colitis; Janus kinase inhibitor; interleukins; IBD; small molecules



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## 1. Introduction

Inflammatory bowel diseases (IBD) are inflammatory chronic-relapsing conditions whose major forms are Crohn's disease (CD) and ulcerative colitis (UC). These diseases are also known for their complications, which occur due to chronic inflammation in most cases, leading to an increased risk of hospitalization, surgery, colorectal cancer, and disability with a high impact on their quality of life. Due to the persistent and progressive nature of IBD, effective treatment should be started ideally at the early stages of the disease to avoid relapses and complications [1]. This would reduce the potential use of corticosteroids, the need for surgery and hospital admission, and improve the overall well-being of IBD patients [2]. This burden on health-care resources is further influenced by a rising global IBD prevalence rate over the years [3]. The Selecting Therapeutic Targets in Inflammatory Bowel Disease (STRIDE) program, recommends targets used for a treatment strategy of treat-to-target. STRIDE 2 recommends the same clinical and endoscopic healing targets mentioned in STRIDE 1 with the addition of serum and fecal biomarker normalization, quality of life restoration, disability prevention, and normal growth in children [4,5]. The current IBD therapeutic armamentarium is confirmed by 5-aminosalicylic acid (5-ASA) compounds, immunosuppressants such as methotrexate and thiopurine, anti-tumor necrosis factor (TNF) alpha, anti-integrin, and anti-IL-12 and 23 among the monoclonal antibodies. Recently, tofacitinib, filgotinib, upadacitinib, and ozanimod, which are non-biological small molecules, have been approved for the treatment of moderate-to-severe UC [2,6].

The purpose of this review article is to describe novel and emerging therapies in IBD. It will highlight the new and emerging target agents such as selective JAK inhibitors, anti-ILs, TNF inhibitors (like polyclonal antibodies), anti-adhesion molecules (including monoclonal

# Pipeline A Novel

**Ákos Végvári**



## **Pipeline A Novel:**

**Pipeline** Peter Schechter, 2009-02-20 A white knuckle ride through a crisis that threatens the world as we know it Newsweek In Peter Schechter's Pipeline a riveting follow up to his widely praised debut Point of Entry a harsh spotlight illuminates the global race to secure the next generation of energy sources and the power that goes along with it A well connected Washington Beltway insider Schechter has written a novel ripped from today's headlines and based on chilling fact a thriller that blends the intelligence and authenticity of John Le Carr with the page turning adrenaline pumping velocity of Robert Ludlum and Michael Crichton and which the Washington Times praises as entertaining and sobering Pipeline Dominique Morisseau, 2019 Nya an inner city public high school teacher is committed to her students but desperate to give her only son Omari opportunities they'll never have When a controversial incident at his upstate private school threatens to get him expelled Nya must confront his rage and her own choices as a parent But will she be able to reach him before a world beyond her control pulls him away With profound compassion and lyricism Pipeline brings an urgent conversation powerfully to the fore Morisseau pens a deeply moving story of a mother's fight to give her son a future without turning her back on the community that made him who he is **Pipe Line** Milt Machlin, 1976 **Subsea Pipeline Systems** Alexander Arnfinn Olsen, 2024-10-21 This book is a comprehensive guide to the classification design construction and maintenance of subsea pipeline systems It provides an in depth exploration of offshore pipeline architecture serviceability and the rigorous standards required for certification and verification The chapters cover critical topics such as risk evaluations for novel features survey and inspection regimes materials and welding specifications geotechnical and environmental conditions flow assurance analysis strength and stability criteria and special considerations for pipe in pipe designs Readers will also discover detailed discussions on pipeline rectification intervention design routing installation procedures testing protocols and maintenance strategies This book is an indispensable resource for anyone involved in the offshore oil and gas industry Engineers architects and safety management professionals will find this book particularly valuable It serves as both a reference for academics and students in industrial design and engineering fields and as a textbook for marine architecture courses Whether you are overseeing the design of new pipelines or ensuring the integrity of existing ones this guide offers the latest research and practical insights to help you navigate the complexities of subsea pipeline systems **Pipeline** M. J. Sperling, 2021-09-09 Fictional novel about the trans Alaskan pipeline Pipeline takes place in Alaska and depicts the conflicts between dedicated environmentalists concerned with Alaska's future and the opportunistic oilmen who care only about constructing a nine hundred mile pipeline through Alaska's beautiful unsurpassed wilderness The novel is centered on a beautiful young woman named Laura and the two men who love her Matt and Seth The three are cast against the problems and consequences of Alaska the last wilderness state Matt is ruggedly handsome a forty year old tough minded individualist working as a troubleshooter for the oilmen Women are sensually drawn to him and men tend to respect his authority Seth is

a newspaper reporter and a native Alaskan a Ralph Nader character about twenty five years old Wealthy intelligent and the leader of the Pikes a dedicated environmentalist group who are concerned with the future of Alaska Laura is the young beauty Troubled in youth she leaves her hometown in Montana to seek romanticism in Alaska The narrative drive of this novel is the antagonistic sensitivity of Matt and Seth as different in makeup and character as is their perception of Alaska Seth is a preservationist in his ideals wanting to protect Alaska her beauty and her natural resources Matt has excelled through life by his wits and sheer gut level ambitions He sees the chance of the state opening up to the oilmen and is determined to gain the power and wealth involved in the operation of building the Alaskan pipeline A power struggle mounts between the Pikes and the opportunists over the infamy of the pipeline the infiltration of outsiders and the aversion of Alaska becoming a concrete domain laden with billboards and litter

Tuberculosis Vaccines Paulo J.G. Bettencourt,2025-08-30 Tuberculosis TB is the leading cause of death by an infectious agent worldwide The Bacillus Calmette Gu rin BCG is the only licensed vaccine against TB and the most widely used vaccine in history Since 1921 billions of people have been vaccinated with BCG resulting in a remarkable decline in infant mortality However although BCG s efficacy to prevent TB meningitis and disseminated disease in children is well established its efficacy to prevent infection disease or reactivation in adolescents and adults is variable Therefore novel TB vaccines are urgently needed Recent clinical trials have shown promising results offering hope for the introduction of a new generation of vaccines to replace or boost BCG The book is structured into five sections each providing sequential relevance to understanding the current landscape and future developments in TB vaccines Section 1 introduces TB and the causative agent Mycobacterium tuberculosis Section 2 presents historical perspectives on BCG and TB vaccine candidates Section 3 focuses on pre clinical vaccines against TB Section 4 examines vaccines against TB currently in clinical trials Finally section 5 discusses public health and societal challenges associated with the development of TB vaccines This book is an essential tool for students clinicians and scientists working in the fields of mycobacteriology vaccine immunology vaccine development and TB vaccines and it is anticipated to stimulate future research in TB vaccine development

*Pipeline Inspection and Health Monitoring Technology* Hongfang Lu,Zhao-Dong Xu,Tom Iseley,Haoyan Peng,Lingdi Fu,2023-01-03 This book includes six chapters aiming to introduce global pipeline inspection and health monitoring technologies comprehensively The pipeline is the blood vessel of the energy system and a vital lifeline project After many years of service the pipeline gradually enters the aging stage Pipeline inspection and health monitoring can effectively reduce the failure and accident risks of the pipeline and it is conducive to integrity management Through case analysis practitioners can have a deeper understanding of the application of related technologies

**Novel and Intelligent Digital Systems: Proceedings of the 5th International Conference (NiDS 2025)** Akrivi Krouska,Phivos Mylonas,Jaime Caro,2025-10-02 This book presents the research contributions from the 5th International Conference on Novel and Intelligent Digital Systems NiDS 2025 held in Athens Greece on September 24 26 2025 and hosted by the University of West

Attica Continuing the success of previous editions NiDS 2025 embraced a hybrid format enabling global participation both onsite and online The conference focused on cutting edge developments in intelligent and adaptive digital systems with particular emphasis on the role of Artificial Intelligence AI and its transformative impact on software engineering digital applications and human centered technologies NiDS 2025 provided a high impact platform for scholars researchers and practitioners to present original research exchange ideas and engage in dialogue across a wide range of disciplines from computational intelligence and data science to smart systems and emerging digital infrastructures By fostering interdisciplinary collaboration NiDS 2025 strengthened global research networks and promoted innovation that bridges academia and industry This collection is a valuable resource for those interested in the future of intelligent digital systems and the evolving challenges of AI driven development

Computer Vision – ECCV 2024 Aleš Leonardis, Elisa Ricci, Stefan Roth, Olga Russakovsky, Torsten Sattler, Gül Varol, 2024-12-03 The multi volume set of LNCS books with volume numbers 15059 up to 15147 constitutes the refereed proceedings of the 18th European Conference on Computer Vision ECCV 2024 held in Milan Italy during September 29 October 4 2024 The 2387 papers presented in these proceedings were carefully reviewed and selected from a total of 8585 submissions They deal with topics such as computer vision machine learning deep neural networks reinforcement learning object recognition image classification image processing object detection semantic segmentation human pose estimation 3d reconstruction stereo vision computational photography neural networks image coding image reconstruction motion estimation

Value-Addition in Agri-Food Industry Waste Through Enzyme Technology Mohammed Kuddus, Pramod W. Ramteke, 2023-02-08 Value Addition in Agri Food Industry Waste through Enzyme Technology Volume Three explores advances in the production of high value added products from agri food industry waste residues using enzyme technology Waste materials used in hydrogen production are categorized as agricultural waste municipal waste industrial waste and other hazardous wastes The book explores advances in value addition to waste materials and includes utilization of industrial agricultural and municipal waste for its bioconversion using enzyme technology This book assembles the novel sources and technologies involved in value added products formation from specific waste materials making it an essential reference to professionals scientists and academics in agri food and related industries Provides biotechnological tools used in valorizing waste for the agri food industry Presents novel and eco friendly alternative processes to produce value added products by food waste utilization Discusses valuable molecules from agriculture and food industry residues as a future sustainable solution to improve public health and protect the environment

Guide to the Practical Use of Chemicals in Refineries and Pipelines Johannes Karl Fink, 2016-05-09 Guide to Practical Use of Chemicals in Refineries and Pipelines delivers a well rounded collection of content references and patents to show all the practical chemical choices available for refinery and pipeline usage along with their purposes benefits and general characteristics Covering the full spectrum of downstream operations this reference solves the many problems that engineers and managers

currently face including corrosion leakage in pipelines and pretreatment of heavy oil feedstocks something that is of growing interest with today's unconventional activity Additional coverage on special refinery additives and justification on why they react the way they do with other chemicals and feedstocks is included along with a reference list of acronyms and an index of chemicals that will give engineers and managers the opportunity to recognize new chemical solutions that can be used in the downstream industry Presents tactics practitioners can use to effectively locate and utilize the right chemical application specific to their refinery or pipeline operation Includes information on how to safely perform operations with coverage on environmental issues and safety including waste stream treatment and sulfur removal Helps readers understand the composition and applications of chemicals used in oil and gas refineries and pipelines along with where they should be applied and how their structure interacts when mixed at the refinery

### **Oil Fictions** Stacey Balkan, Swaralipi

Nandi, 2021-10-15 Oil like other fossil fuels permeates every aspect of human existence Yet it has been largely ignored by cultural critics especially in the context of the Global South Seeking to make visible not only the pervasiveness of oil in society and culture but also its power Oil Fictions stages a critical intervention that aligns with the broader goals of the energy humanities Exploring literature and film about petroleum as a genre of world literature Oil Fictions focuses on the ubiquity of oil as well as the cultural response to petroleum in postcolonial states The chapters engage with African South American South Asian Iranian and transnational petrofictions and cover topics such as the relationship of colonialism to the fossil fuel economy issues of gender in the Thermocene epoch and discussions of migration precarious labor and the petro diaspora This unique exploration includes testimonies of the oil encounter through memoirs journals and interviews from a diverse geopolitical grid ranging from the Permian Basin to the Persian Gulf By engaging with non Western literary responses to petroleum in a concentrated sustained way this pathbreaking book illuminates the transnational dimensions of the discourse on oil It will appeal to scholars and students working in literature and science studies energy humanities ecocriticism petrocriticism environmental humanities and Anthropocene studies In addition to the editors the contributors to this volume include Henry Obi Ajumeze Rebecca Babcock Ashley Dawson Sharae Deckard Scott DeVries Kristen Figgins Amitav Ghosh Corbin Hiday Helen Kapstein Micheal Angelo Rumore Simon Ryle Sheena Stief Imre Szeman Maya Vinai and Wendy W Walters

*Youmans and Winn Neurological Surgery E-Book* H. Richard Winn, 2022-01-21 Widely regarded as the definitive reference in the field Youmans and Winn Neurological Surgery offers unparalleled multimedia coverage of the entirety of this complex specialty Fully updated to reflect recent advances in the basic and clinical neurosciences the 8th Edition covers everything you need to know about functional and restorative neurosurgery deep brain stimulation stem cell biology radiological and nuclear imaging and neuro oncology as well as minimally invasive surgeries in spine and peripheral nerve surgery and endoscopic and other approaches for cranial procedures and cerebrovascular diseases In four comprehensive volumes Dr H Richard Winn and his expert team of editors and authors provide updated content a

significantly expanded video library and hundreds of new video lectures that help you master new procedures new technologies and essential anatomic knowledge in neurosurgery Discusses current topics such as diffusion tensor imaging brain and spine robotic surgery augmented reality as an aid in neurosurgery AI and big data in neurosurgery and neuroimaging in stereotactic functional neurosurgery 55 new chapters provide cutting edge information on Surgical Anatomy of the Spine Precision Medicine in Neurosurgery The Geriatric Patient Neuroanesthesia During Pregnancy Laser Interstitial Thermal Therapy for Epilepsy Fetal Surgery for Myelomeningocele Rehabilitation of Acute Spinal Cord Injury Surgical Considerations for Patients with Polytrauma Endovascular Approaches to Intracranial Aneurysms and much more Hundreds of all new video lectures clarify key concepts in techniques cases and surgical management and evaluation Notable lecture videos include multiple videos on Thalamotomy for Focal Hand Dystonia and a video to accompany a new chapter on the Basic Science of Brain Metastases An extensive video library contains stunning anatomy videos and videos demonstrating intraoperative procedures with more than 800 videos in all Each clinical section contains chapters on technology specific to a clinical area Each section contains a chapter providing an overview from experienced Section Editors including a report on ongoing controversies within that subspecialty Enhanced eBook version included with purchase Your enhanced eBook allows you to access all of the text figures and references from the book on a variety of devices

*Computational Non-coding RNA Biology* Yun Zheng, 2018-09-14 Computational Non coding RNA Biology is a resource for the computation of non coding RNAs The book covers computational methods for the identification and quantification of non coding RNAs including miRNAs tasiRNAs phasiRNAs lariat originated circRNAs and back spliced circRNAs the identification of miRNA siRNA targets and the identification of mutations and editing sites in miRNAs The book introduces basic ideas of computational methods along with their detailed computational steps a critical component in the development of high throughput sequencing technologies for identifying different classes of non coding RNAs and predicting the possible functions of these molecules Finding quantifying and visualizing non coding RNAs from high throughput sequencing datasets at high volume is complex Therefore it is usually possible for biologists to complete all of the necessary steps for analysis Presents a comprehensive resource of computational methods for the identification and quantification of non coding RNAs Introduces 23 practical computational pipelines for various topics of non coding RNAs Provides a guide to assist biologists and other researchers dealing with complex datasets Introduces basic computational methods and provides guidelines for their replication by researchers Offers a solution to researchers approaching large and complex sequencing datasets

*Proteogenomics* Ákos Végvári, 2016-09-29 This book highlights key technologies and identifies areas for further development in proteogenomics The utility and usefulness of very large Omics data sets Next Gen Sequencing of DNA RNA seq ribosome profiling mass spectrometry and antibody based proteomics is discussed and opportunities and challenges of related bioinformatics applications are outlined The reader will be able to appreciate the interdisciplinary nature of the continuously evolving area of proteogenomics which has already

grown beyond its original concept of verifying gene annotations by proteomics The chapters presented in this book are arranged to offer a general overview rather than to provide detailed descriptions of technologies The selected applications will provide useful insight into the level of detail that can be obtained in relation to certain diseases areas including cancer biology and personalized medicine The readers will find that each chapter delivers a comprehensive approach to proteogenomics each from the point of view of a specific application Research scientists interested in innovative processes that can offer a unique and at the same time a more complete access to technological developments and concepts that in turn can contribute to a better understand biological functions should read this book

**The Papers of Independent Authors, Volume 7** Publisher Dna,2008-04 This volume of magazine contains following series Algorithms and Programming Computer Engineering Construction Physics and Astronomy Power Engineering Unaccounted New Frontiers in Artificial Intelligence

Katsutoshi Yada,Yasufumi Takama,Koji Mineshima,Ken Satoh,2023-07-18 This book constitutes extended revised and selected papers from the 13th International Symposium on Artificial Intelligence supported by the Japanese Society for Artificial Intelligence JSAI isAI 2021 held online in November 2021 The 26 full papers were carefully selected from 86 submissions The papers are organized in the volume according to the following workshops 15th International Workshop on Juris Informatics JURISIN 2021 18th Workshop on Logic and Engineering of Natural Language Semantics LENLS 18 5th International Workshop on SCientific DOCument Analysis SCI DOCA 2021 Workshop on Artificial Affective Kansei Intelligence KANSEI AI 2021 5th Workshop on Artificial Intelligence of and for Business AI Biz 2021 **The Log** ,1932

*Organic Growth Disciplines* Devanathan Sudharshan,2019-09-09 If your firm doesn t grow sustainably can you grow professionally In Organic Growth Disciplines business expert Devanathan Sudharshan introduces a new framework for exploring the fuzzy front end of the search for growth opportunities **The Cambridge Handbook of Stakeholder**

**Theory** Jeffrey S. Harrison,Jay B. Barney,R. Edward Freeman,Robert A. Phillips,2019-05-09 A comprehensive foundation for stakeholder theory written by many of the most respected and highly cited experts in the field



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