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Basic Study

Prediction of clinically actionable genetic alterations from colorectal cancer histopathology images using deep learning

Hyun-Jong Jang, Ahwon Lee, J Kang, In Hye Song, Sung Hak Lee

Abstract

BACKGROUND

Identifying genetic mutations in cancer patients have been increasingly important because distinctive mutational patterns can be very informative to determine the optimal therapeutic strategy. Recent studies have shown that deep learning-based

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Prediction of clinically actionable genetic alterations from colorect

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Deep learning for prediction of colorectal cancer outcome ...

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)32998-8/fulltext

Deep learning can be used to develop biomarkers for automatic **prediction** of patient outcome directly from conventional **histopathology images**. In **colorectal cancer**, the marker was found to be a **clinically** useful prognostic marker in the analysis of a large series of patients who received consistent, modern **cancer** treatment.

Cited by: 6 **Author:** Ole-Johan Skrede, Ole-Johan Skrede, ...
Publish Year: 2020

[PDF] Deep learning for prediction of colorectal cancer outcome ...

https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(19)32998-8.pdf

restrictions **using** the terms "**deep learning**", "**prediction**", "survival", "**cancer**", and "**histology**". We systematically reviewed the 214 search results, and found 18 original research studies which applied **deep learning** to predict patient outcome or related attributes **using histopathology images**.

Predicting survival from colorectal cancer histology ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6345440

Jan 24, 2019 · In solid tumors such as **colorectal cancer** (CRC), lymphocytes and fibroblasts profoundly shape the tumor microenvironment and have a significant **impact on clinical** end points [25,26]. Tumor-infiltrating lymphocytes have been quantified with classical **image analysis** methods [27 , 28] and deep learning methods [29], which for some tumor types has been ...

Cited by: 42 **Author:** Jakob Nikolas Kather, Johannes Krisam...
Publish Year: 2019

Predicting survival from colorectal cancer histology ...

https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002730

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Deep learning for prediction of colorectal cancer outcome ...

https://www.sciencedirect.com/science/article/pii/S0140673619329988

Feb 01, 2020 · **Deep learning** can be used to develop biomarkers for automatic **prediction** of patient outcome directly from conventional **histopathology images**. In **colorectal cancer**, the marker was found to be a **clinically** useful prognostic marker in the analysis of a large series of patients who received consistent, modern **cancer** treatment.

Cited by: 13 **Author:** Ole-Johan Skrede, Ole-Johan Skrede, Se...
Publish Year: 2020

Pan-cancer image-based detection of clinically actionable ...

https://www.nature.com/articles/s43018-020-0087-6

Jul 27, 2020 · Coudray, N. et al. Classification and mutation **prediction** from non-small cell lung **cancer histopathology images using deep learning**. Nat. Med. 24 , 1559–1567 (2018).

Cited by: 7 **Author:** Jakob Nikolas Kather, Jakob Nikolas Kat...
Publish Year: 2020

Predicting survival from colorectal cancer histology ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6345440

Jan 24, 2019 · Deep learning is an inexpensive tool to **predict the clinical course of CRC patients** based on ubiquitously available **histological images**. Prospective validation studies are needed to firmly establish this biomarker for **routine clinical use**.

Cited by: 68 **Author:** Jakob Nikolas Kather, Johannes Krisam, ...
Publish Year: 2019

Deep Learning for Prediction of Colorectal Cancer Outcome ...

https://pubmed.ncbi.nlm.nih.gov/32007170

Background: Improved markers of prognosis are needed to stratify patients with early-stage **colorectal cancer** to refine selection of adjuvant therapy. The aim of the present study was to develop a biomarker of patient outcome after primary **colorectal cancer** resection by directly analysing scanned conventional haematoxylin and eosin stained sections **using deep learning**.

Cited by: 13 **Author:** Ole-Johan Skrede, Ole-Johan Skrede, Se...
Publish Year: 2020

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Prediction of clinically actionable genetic alterations from colorecta

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Deep learning for prediction of colorectal cancer outcome ...

https://www.sciencedirect.com/science/article/pii/S0140673619329988

Feb 01, 2020 · **Deep learning** can be used to develop biomarkers for automatic **prediction** of patient outcome directly from conventional **histopathology images**. In **colorectal cancer**, the marker was found to be a **clinically** useful prognostic marker in the analysis of a large series of patients who received consistent, modern **cancer** treatment.

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Publish Year: 2020

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Cited by: 12 **Author:** Ole-Johan Skrede, Ole-Johan Skrede, Sepp ...
Publish Year: 2020

Deep learning algorithm identifies tumor subtypes based on ...

https://www.uchicagomedicine.org/forefront/cancer...

Jul 29, 2020 · Another research group has independently validated these results with a similar AI algorithm applied to **images** from common **cancer** types. Their study was published in the same issue of Nature **Cancer**. The study, "Pan-**cancer** image-based detection **of clinically actionable genetic alterations**," was published July 27, 2020 in Nature **Cancer**.

Predicting survival from colorectal cancer histology ...

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6345440

Jan 24, 2019 · Deep learning is an inexpensive tool to **predict the clinical course of CRC patients** based on ubiquitously available **histological images**. Prospective validation studies are needed to firmly