OPEN-I GOALS

- Enhance users’ search experience
- Provide direct access to relevant images from image databases and literature
- Improve relevance of biomedical literature search results by targeting the visual content in articles
- Find information relevant to a patient’s medical case
OPEN-I USER INTERFACE

https://openi.nlm.nih.gov/
OPEN-I DATA SOURCES

- The Open Access Subset of PubMed Central (PMC)
  - Articles: 1,139,338
  - Images: 3,707,654

- Chest X-rays from the Indiana University hospital network (CXR)
  - Radiology reports: 3,955
  - Images: 7,470

- USC Digital Library Orthopedic Surgical Anatomy Teaching Collection (USC)
  - Images: 2,064

- Images from the NLM History of Medicine Division (HMD)
  - Images: 67,517

- MedPix
  - Cases: 1,761
  - Images: 8,084
OPEN-I DATA GROWTH

Number of images

- MedPix
- HMD
- USC
- CXR
- PMC

Number of images:
- 2011: 3,792,789
OPEN-I USERS

Google Analytics Home

- Users: 2.5M
- Sessions: 3M
- Bounce Rate: 87.07%
- Session Duration: 0m 45s

Last 12 months:

AUDIENCE OVERVIEW

Right now

55
active users on site
PREPARING CITATIONS FOR INDEXING
Reduced proliferation in breast cancer cells contacting the neighboring adipocytes in human breast cancer tissues.

Ryu HS, Lee HY, Han W, Noh DY, Moon HG - Breast Cancer

Affiliation: Department of Pathology, Seoul National University College of Medicine, 28 Yongon-dong, Chongno-gu, Seoul, 110-744, South Korea.

The process of tumor formation and progression is a result of the complex interaction between malignant epithelial cells and the various cell populations in the tumor microenvironment. Recently, the role of cancer-associated adipocytes in cancer progression has been an active area of research, and many studies have suggested a proinvasive and prometastatic effect of the cancer-associated adipocytes. To overcome the issue of intertumoral heterogeneity, we semiquantitatively analyzed the histologic grade of cancer cells on the adipose side and on the gland side within the same tumor in 107 patients whose tumors had moderate tumor–adipose contact (between 0.4 and 0.6; Fig. 1d). We measured the degree of tubule formation, nuclear pleomorphism, and mitotic count, which are the three components of the widely used Elston–Ellis modification of the Scarff-Bloom-Richardson histologic grading system for both adipose-side and gland-side tumor cells. The tumor cells on the adipose side showed significantly lower mitotic index when compared with that of the tumor cells on the gland side... The significant association with mitotic index and the cancer cells’ distance to the adipose tissue was only seen in estrogen receptor-negative breast tumors (Fig. 1e, representative case shown in Fig. 1f). There was no significant difference between the adipose-side and gland-side cells in tubule formation and nuclear pleomorphism... In conclusion, our analysis of human breast cancer samples showed that tumor cells residing close to the adipose tissue showed significantly lower mitotic count than cells distant from the adipose tissue. Our findings suggest that, contrary to the prevailing concept of the cancer-promoting role of cancer-associated adipocytes, the true interaction between cancer cells and the neighboring adipose tissue can be a complex one.
SUMMARY GENERATION

- **Problem:** 50,000 articles in the open access subset of PMC have no abstracts.
- **Solution:** automatic summarization
  - Bottom-line extractor + key-phrase extractor
    - Outperforms the best individual summarizer by 35%
  - Top 10 sentences in the order of occurrence in the article
  - Key-phrase extractor
    - KEA to identify most salient words
      - Outperformed an alternative key-phrase extractor by 25%
    - Sentences with high density of distinct salient words
Flood events, OWA, risk preference, risk attitudes, flood hazard assessment, fuzzy AHP

Integrated flood hazard assessment based on spatial ordered weighted averaging method considering spatial heterogeneity of risk preference.
OPEN-I® & MEDPIX® CASE SUBMISSION SERVER

MedPix – system for teaching clinical imaging developed by Dr. James Smirniotopoulos

- MedPix provides 830 CME Teaching File Cases
- Developed case submission server
  - For submission, editing and publication of case reports to Open-i and MedPix
**USE OF OPEN-I API**

- **NICHD Placental Atlas Tool**
  - The Placental Atlas Tool provides access to a comprehensive, centralized placental knowledge base, analytics tools, relevant research, publications, and resources.

- **Note:** This is a mock up and the PAT system won’t be live until the end of the calendar year.
An Image Explorer displays thumbnails of Open-i images and relevant metadata, linked to any publications NICHD have in the system, and linked back to the Open-i detailed view page.
OBTAINING NEW COLLECTIONS

- Dermatology collection

Clem McDonald

Rodney Long
WORKING ON ANSWERING QUERIES SUCH AS “WHAT ARE THE ULTRASOUND FINDINGS IN CHILDREN WITH APPENDICITIS”

- ImageCLEFcaption 2017 evaluation (Asma Ben Abacha)
  - Concept detection
  - Caption prediction
  - Open-i-based approach ranked first over all runs in the challenge (11 groups, 71 runs)
  - Deep Learning (CNN, GoogLeNet) second best in the ranking of runs without the use of external resources

- Started exploring Visual Question Answering based on MedPix /Open-i (Jason Lau)