Revision
Robbins Review

{ ومن لم يذق مرّ التعلُّمِ ساعةً.. تجرع ذلَّ الجهل طوال حياتهِ }

1. A 24-year-old man has developed abdominal pain and increasing fatigue over the past 6 months. On physical examination, he is afebrile and appears pale. On palpation, there is mild pain in the right lower quadrant of the abdomen. There are no masses, and bowel sounds are active. Laboratory studies show hemoglobin, 8.9 g/dL; hematocrit, 26.7%; MCV, 74 μm^3; platelet count, 255,000/mm^3; and WBC count, 7780/mm^3. His stool is positive for occult blood. Upper gastrointestinal endoscopy and colonoscopy showed no lesions. One month later, he continues to experience the same abdominal pain. Which of the following is most likely to cause this patient's illness?
   A. Acute appendicitis
   B. Angiodysplasia
   C. Celiac disease
   D. Diverticulosis
   E. *Giardia lamblia* infection
   F. Meckel diverticulum

2. A 53-year-old man consumes a very large meal, washed down with considerable alcohol. The ensuing discomfort prompts him to take an emetic, but soon afterward he develops lower chest pain. Physical examination reveals crepitus in subcutaneous tissue over his chest along with tachycardia and tachypnea. Which of the following abnormalities of the esophagus is most likely present in this man?
   A. Stricture
   B. Achalasia
   C. Ectopia
   D. Rupture
   E. Varices

3. A 57-year-old woman has had burning epigastric pain after meals for more than 1 year. Physical examination shows no abnormal findings. Upper gastrointestinal endoscopy shows an erythematous patch in the lower esophageal mucosa. A biopsy specimen shows basal zone squamous epithelial hyperplasia, elongation of lamina propria papillae, and scattered intraepithelial neutrophils with some eosinophils. Which of the following is the most likely diagnosis?
   A. Barrett esophagus
   B. Esophageal varices
   C. Iron deficiency
   D. Reflux esophagitis
   E. Systemic sclerosis

4. A 51-year-old man has sudden onset of massive emesis of bright red blood. On physical examination, his temperature is 36.9° C, pulse is 103/min, respirations are 23/min, and blood pressure is 85/50 mm Hg. His spleen tip is palpable. Laboratory studies show a hematocrit of 21%. The serologic test result for HBsAg is positive. He has had no prior episodes of hematemesis. The hematemesis is most likely to be a consequence of which of the following?
   A. Barrett esophagus
   B. *Candida albicans* infection
   C. Esophageal varices
   D. Reflux esophagitis
   E. Squamous cell carcinoma
   F. Zenker diverticulum

5. A 72-year-old man takes large quantities of nonsteroidal anti-inflammatory drugs (NSAIDs) because of chronic degenerative arthritis of the hips and knees. Over the past 2 weeks, he has had epigastric pain with nausea and vomiting and an episode of hematemesis. On physical examination, there are no remarkable findings. A gastric biopsy specimen is most likely to show which of the following lesions?
   A. Acute gastritis
   B. Adenocarcinoma
   C. Epithelial dysplasia
   D. *Helicobacter pylori* infection
   E. Hyperplastic polyp

6. A 47-year-old woman with a lengthy history of heartburn and dyspepsia experiences sudden onset of abdominal pain. On physical examination, she has severe mid epigastric pain with guarding. Bowel sounds are reduced. An abdominal plain film radiograph shows free air under the left leaf of the diaphragm. She is immediately taken to surgery, and a perforated duodenal ulcer is repaired. Which of the following organisms is most likely to have produced these findings?
   A. *Campylobacter jejuni*
   B. *Cryptosporidium parvum*
   C. *Giardia lamblia*
   D. *Helicobacter pylori*
   E. *Salmonella typhi*
   F. *Shigella flexneri*
   G. *Yersinia enterocolitica*

7. A 52-year-old man has had a 4-kg weight loss and nausea for the past 6 months. He has no vomiting or diarrhea. On physical examination, there are no remarkable findings. Upper gastrointestinal endoscopy shows a 6-cm area of irregular, pale fundic mucosa and loss of the rugal folds. A biopsy specimen shows a monomorphous infiltrate of lymphoid cells microscopically. Helicobacter pylori organisms are identified in mucus overlying adjacent mucosa. Cytogenetic analysis shows t(11;18)(q21;q21). He receives antibiotic therapy for H. pylori, and the repeat biopsy specimen shows a resolution of the infiltrate. What is the most likely diagnosis?
   A. Autoimmune gastritis
   B. Chronic gastritis
   C. Crohn disease
   D. Diffuse large B-cell lymphoma
   E. Gastrointestinal stromal tumor
   F. Mucosa-associated lymphoid tissue tumor

8. A 21-year-old man has had increasingly voluminous, bulky, foul-smelling stools and a 7-kg weight loss for the past year. There is no history of hematemesis or melena. He has some bloating, but no abdominal pain. On physical examination, there are no palpable abdominal masses, and bowel sounds are present. Which of the following laboratory findings is most likely to be present on examination of his stool?
   A. *Entamoeba histolytica* trophozoites
   B. *Giardia lamblia* cysts
   C. Increased stool fat
   D. Occult blood
   E. *Vibrio cholerae* organisms

9. Over a holiday weekend, more than 100 adults at a resort hotel develop a diarrheal illness marked by voluminous, watery stools more than 10 times per day. They also report headache, abdominal cramping pain, and myalgias. On physical examination they have manifestations of dehydration and mild fever. Laboratory studies of stool samples show no increase in leukocytes or fat, and no RBCs. Their illness lasts just 1 to 3 days and resolves with no sequelae. Which of the following infectious agents is the most likely cause for their illness?
   A. Cytomegalovirus
   B. *Clostridium botulinum*
   C. Norovirus
   D. *Staphylococcus aureus*
   E. *Strongyloides stercoralis*
   F. *Vibrio cholerae*

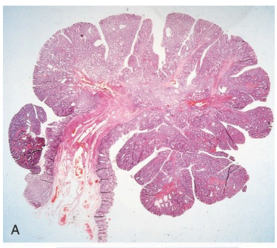
10. A 5-month-old, previously healthy infant girl in Bangladesh develops a watery diarrhea that lasts for 1 week. The infant has a mild fever during the illness, but has no abdominal pain or swelling. On physical examination, her temperature is 37.7° C. A stool sample is negative for occult blood, ova, or parasites. Her parents are told to give her plenty of fluids, and she recovers fully. Which of the following organisms is most likely to produce these findings?
    A. *Campylobacter jejuni*
    B. *Cryptosporidium parvum*
    C. *Escherichia coli*
    D. *Listeria monocytogenes*
    E. Norwalk virus
    F. Rotavirus
    G. *Shigella flexneri*

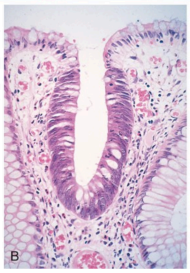
11. A 30-year-old woman has a 5-year history of recurrent episodes marked by days of abdominal bloating with alternating constipation and diarrhea. She notes hard stools of narrow caliber, low volume mucous diarrhea, and pain in the left lower quadrant. Her symptoms are relieved by defecation, which occurs more frequently now. On physical examination there are no abnormal findings. Laboratory studies including stool for ova and parasites, bacterial pathogens, and fat show no abnormalities. An abdominal CT scan is unremarkable. What is the most likely diagnosis?
    A. Cystic fibrosis
    B. Diverticular disease
    C. Inflammatory bowel disease
    D. Irritable bowel syndrome
    E. Viral gastroenteritis

12. A 26-year-old man has had intermittent cramping abdominal pain and low-volume diarrhea for 3 weeks. On physical examination, he is afebrile; there is mild lower abdominal tenderness but no masses, and bowel sounds are present. A stool sample is positive for occult blood. The symptoms subside within 1 week. Six months later, the abdominal pain recurs with perianal pain. On physical examination, there is now a perirectal fistula. Colonoscopy shows many areas of mucosal edema and ulceration and some areas that appear normal. Microscopic examination of a biopsy specimen from an ulcerated area shows a patchy acute and chronic inflammatory infiltrate, crypt abscesses, and noncaseating granulomas. Which of the following underlying disease processes best explains these findings?
    A. Amebiasis
    B. Crohn disease
    C. Sarcoidosis
    D. Shigellosis
    E. Ulcerative colitis

13. The mother of a 4-year-old child notes blood when laundering his underwear. Physical examination reveals a rectal mass. On proctoscopy, there is a smooth-surfaced, pedunculated, 1.5-cm polyp. It is excised and microscopically shows cystically dilated crypts filled with mucin and inflammatory debris, but no dysplasia. What is the most likely diagnosis?
    A. Familial adenomatous polyposis
    B. Gardner syndrome
    C. Juvenile polyp
    D. Lynch syndrome
    E. Peutz-Jeghers syndrome

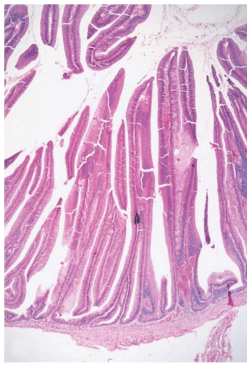
14. A 53-year-old woman undergoes a routine checkup. The only abnormal finding is a stool specimen that contains occult blood. Colonoscopy shows a 1.5-cm, solitary, rounded, erythematous polyp on a 0.5-cm stalk at the splenic flexure. The polyp is removed; its histologic appearance is shown in the figure at low (A) and high (B) magnifications. Her colonic lesion is most likely associated with which of the following?





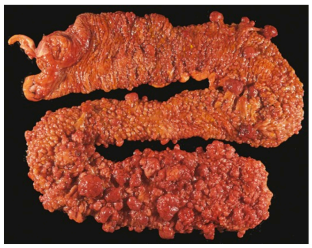
A. Low risk for development of carcinoma
B. Inheritance of an abnormal tumor suppressor gene
C. Presence of similar lesions in the small intestine
D. History of iron deficiency anemia
E. Risk for development of endometrial carcinoma

15. A 70-year-old man has a routine health maintenance examination. On physical examination, there are no remarkable findings, but a stool sample is positive for occult blood. A colonoscopy is performed and shows a 5-cm sessile mass in the upper portion of the descending colon at 50 cm from the anal verge. The histologic appearance at low power of a biopsy specimen of the lesion is shown in the figure. The patient refused further workup and treatment. Five years later, he has constipation, microcytic anemia, and a 5-kg weight loss over 6 months. On surgical exploration, there is a 7-cm mass encircling the descending colon. Which of the following neoplasms is he now most likely to have?



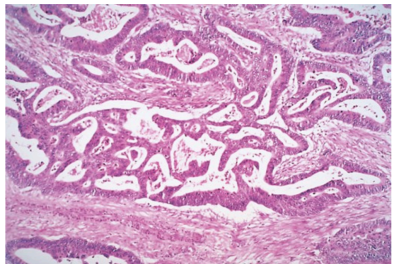
A. Adenocarcinoma
B. Non-Hodgkin lymphoma
C. Carcinoid tumor
D. Leiomyosarcoma
E. Mucinous cystadenoma
F. Villous adenoma

16. A 19-year-old man is advised to see his physician because genetic screening has detected a disease in other family members. On physical examination, a stool sample is positive for occult blood. A colonoscopy is performed, followed by a colectomy. The figure shows the gross appearance of the mucosal surface of the colectomy specimen. Microscopic examination shows these lesions are tubular adenomas. Molecular analysis of this patient's normal fibroblasts is most likely to show a mutation in which of the following genes?



A. *APC*
B. *MLH1*
C. *KRAS*
D. *NOD2*
E. *p53*

17. A 33-year-old man has a routine health maintenance examination. A stool sample is positive for occult blood. On colonoscopy, a 6-cm ulcerative lesion is seen projecting into the cecum. There are three smaller sessile lesions from 1 to 3 cm in size. The microscopic appearance of a section of the ulcerated lesion is shown in the figure. The smaller lesions are reported as sessile serrated adenomas. Which of the following molecular biological events is thought to be most critical in the development of such lesions?



A. Amplification of *ERBB2* gene
B. Defective DNA mismatch repair gene
C. Germline transmission of a defective *RB1* gene
D. Overexpression of E-cadherin gene
E. Translocation of retinoic acid receptor alpha gene

Answers:

1. F. About 2% of individuals have a Meckel diverticulum, an embryologic remnant of the omphalomesenteric duct, but only a small subset of these individuals have ectopic gastric mucosa within it, which causes intestinal ulceration. The symptoms may mimic acute appendicitis, but appendicitis should not last for 1 month or cause significant blood loss. Angiodysplasia may be difficult to detect, and it is almost always seen in patients older than 70 years, but can cause significant blood loss. Celiac disease can occur in young individuals, but it does not produce significant hemorrhage. Diverticulosis can be associated with hemorrhage, but the diverticula are almost always in the colon of older persons. Giardiasis produces a self-limited, watery diarrhea without hemorrhage.

2. D. Grand Admiral Baron Jan Gerrit van Wassenaer was attended by Dr. Herman Boerhaave in 1724, who then described esophageal rupture. Boerhaave syndrome may follow forceful vomiting, or may occur as a complication of instrumentation. Dissection of air from the rupture extends into soft tissue, producing the subcutaneous emphysema. There is no serosal barrier above the diaphragm, so esophageal contents spill into the chest cavity, producing marked mediastinitis that is hard to treat. A stricture is likely to occur with long-standing inflammation or from the fibrosis associated with systemic sclerosis (scleroderma). Achalasia is a functional obstruction from failure of inhibitory neurons that relax the lower esophageal sphincter. Ectopia refers to tissue that is out of place, most often gastric mucosa that is in the esophagus, which can lead to esophagitis. Varices present a risk for marked bleeding.

3. D. Her ongoing inflammatory process results from reflux of acid gastric contents into the lower esophagus. Gastroesophageal reflux disease (GERD) is a common problem that stems from a variety of causes, including sliding hiatal hernia, decreased tone of the lower esophageal sphincter, and delayed gastric emptying. Patients may have a history of heartburn after eating. Barrett esophagus is a complication of long-standing GERD and is characterized by columnar metaplasia of the squamous epithelium that normally lines the esophagus. There may be inflammation and mucosal ulceration overlying varices, but this condition usually does not have heartburn as the major feature. Esophageal varices from portal hypertension can lead to marked hematemesis. A rare complication of iron deficiency is the appearance of an upper esophageal web (Plummer-Vinson syndrome). Progressive fibrosis with stenosis is found in scleroderma.

4. C. Variceal bleeding is a common complication of hepatic cirrhosis, which can be an outcome of chronic hepatitis B infection. Portal hypertension leads to dilated submucosal esophageal veins that can erode and bleed profusely. Barrett esophagus is a columnar metaplasia that results from gastroesophageal reflux disease (GERD). Bleeding is not a key feature of this disease. Esophageal candidiasis may be seen in immunocompromised patients, but it most often produces raised mucosal plaques and is rarely invasive. GERD may produce acute and chronic inflammation and, rarely, massive hemorrhage. Esophageal carcinomas may bleed, but not enough to cause massive hematemesis. A Zenker diverticulum is located in the upper esophagus and results from cricopharyngeal motor dysfunction; it presents a risk for aspiration, but not for hematemesis.

5. A. Prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs) is an important cause of acute gastritis. NSAIDs inhibit cyclooxygenase-dependent synthesis of prostaglandins E_2 and I_2, which stimulate nearly all defense mechanisms. Excessive alcohol consumption and smoking also are possible causes. Acute gastritis tends to be diffuse and, when severe, can lead to significant mucosal hemorrhage that is difficult to control. Epithelial dysplasia may occur at the site of chronic gastritis. It is a forerunner of gastric cancer. Infection with *Helicobacter pylori* is not associated with acute gastritis. Hyperplastic polyps of the stomach do not result from acute gastritis, but may arise in association with chronic gastritis. Acute gastritis does not increase the risk of gastric adenocarcinoma.

6. D. Although they are not found in the duodenum. H. pylori alter the microenviroment of the stomach, causing the stomach & duodenum to be susceptible to peptic ulcer disease. Virtually, all duodenal ulcers are associated with H. pylori infection. Ulceration can extend through the muscilarus and result in perforation as in this case. The other organisms are not related to peptic ulcer formation, but to infectious diarrheal illnesses.

7. F. Certain gastrointestinal lymphomas that arise from mucosa-associated lymphoid tissue (MALT) are called *MALT lymphomas.* Gastric lymphomas that occur in association with *Helicobacter pylori* infection are composed of monoclonal B cells, whose growth and proliferation depend on cytokines derived from T cells that are sensitized to *H. pylori* antigens. Treatment with antibiotics eliminates *H. pylori* and the stimulus for B-cell growth. However, lesions acquiring additional mutations, such as *p53*, may become more aggressive. MALT lesions can occur anywhere in the gastrointestinal tract, although they are rare in the esophagus and appendix. In *H. pylori* chronic gastritis, which may precede lymphoma development, there are lymphoplasmacytic mucosal infiltrates. Diffuse large B-cell lymphomas and other non-Hodgkin lymphomas that are not MALT lymphomas do not regress with antibiotic therapy. Autoimmune gastritis is a risk for development of gastric adenocarcinoma. Crohn disease is rare in the stomach and is not related to *H. pylori* infection. Gastrointestinal stromal tumors are uncommon; these bulky tumors may be proliferations of interstitial cells of Cajal, myenteric plexus cells that are thought to be the pacemaker of the gut.

8. C. Fat malabsorption can occur from impaired intraluminal digestion. Smelly, bulky stools containing increased amounts of fat (steatorrhea) are characteristic. Pancreatic or biliary tract diseases are important causes of fat malabsorption. Amebiasis can produce a range of findings from a watery diarrhea to dysentery with mucus and blood in the stool. Giardiasis produces mainly a watery diarrhea. Malabsorption with steatorrhea is unlikely to be associated with bleeding. Cholera results in a massive watery diarrhea.

9. C. Norovirus outbreaks result from contamination of food or water, most often in venues where multiple persons congregate. Was it the resort pool? Noroviruses, as well as the *Giardia* parasite, are resistant to chlorination. Was it the buffet? Salads, shellfish, and meats are often implicated. The voluminous diarrhea suggests small intestinal involvement. The lack of leukocytes makes bacterial infection less likely. Cytomegalovirus infections are more likely in immunocompromised persons. Botulism leads to paralysis from a neurotoxin. Staphylococcal food poisoning tends to be abrupt in onset and of short duration. Strongyloidiasis tends to persist for months to years. Cholera produces life-threatening fluid loss.

10. F. Rotavirus is the most common cause of viral gastroenteritis in children. It is a self-limited disease that affects mostly infants and young children, who can lose a significant amount of fluid relative to their size and can quickly become dehydrated. The death rate is less than 1%. *Campylobacter jejuni* is more often seen in children and adults as a food-borne cause of fever, abdominal pain, and diarrhea. Cryptosporidiosis most often causes a watery diarrhea in immunocompromised adults. Enterohemorrhagic strains of *Escherichia coli* can produce hemolytic uremic syndrome in young children. Listeriosis can be a congenital infection that is present along with meningitis and sepsis at birth; in infants, children, and adults, it is a food-borne or water-borne infection that tends to occur in epidemics. Norwalk virus is a common cause of diarrheal illness in adults. Shigellosis produces dysentery with bloody diarrhea.

11. D. Irritable bowel syndrome (IBS) can be difficult to diagnose because of protean manifestations found in many other conditions. No pathologic or physiologic abnormalities can be identified reliably with IBS. Patients may benefit from behavioral therapies. Placebos may work as well as pharmacotherapies. The lack of an increased stool fat in this case indicates that chronic pancreatitis and cystic fibrosis are unlikely. Diverticular disease is more likely to occur in older adults. Inflammatory bowel disease has both pathologic and radiographic findings. Viral gastroenteritis is unlikely to persist for 5 years.

12. B. The clinical and histologic features are consistent with Crohn disease, one of the idiopathic inflammatory bowel diseases. Crohn disease is marked by segmental bowel involvement and transmural inflammation that leads to strictures, adhesions, and fistula. Ulcerative colitis has mucosal involvement extending variable distances from the rectum. In contrast to Crohn disease, the mucosal involvement is diffuse and does not show "skip areas." Fissures and fistulas are not frequently seen in ulcerative colitis. The findings in Crohn disease and ulcerative colitis overlap, and in at least 10% of cases it may be impossible to differentiate between them—a so-called indeterminate colitis. Generally, crypt abscesses are more typical of ulcerative colitis, and granulomas are more typical of Crohn disease, but these features are not present in most biopsy specimens from patients with either condition. Amebiasis and shigellosis are infectious processes that can cause mucosal ulceration, but they do not produce granulomas or fissures. Sarcoidosis can involve many organs and give rise to noncaseating granulomas; however, involvement of the intestines is uncommon, and sarcoidosis does not give rise to ulcerative disease.

13. C. Juvenile polyps are the most common form of hamartomatous polyp. Singly they are likely to be sporadic and the only complication is rectal prolapse; but when multiple polyps are present they may be the result of an autosomal dominant syndrome with risk for development of adenocarcinoma. The remaining choices include polyposis syndromes unlikely to appear at this age.

14. A. The figure shows a solitary pedunculated adenoma of the colon with no evidence of malignancy. High magnification shows a small focus of dysplastic, non–mucin-secreting epithelial cells lining a colonic crypt, giving rise to "tubular" architecture. Such a small (<2 cm), solitary, tubular adenoma is unlikely to harbor a focus of malignancy; a search for metastases is unwarranted. Such colonic adenomas are more likely to occur in older persons; hence the recommendation for colonoscopy screening after age 50. Removing such an adenoma does not leave the chance for further growth of the lesion with possible development of adenocarcinoma. Individuals who inherit a mutant APC gene usually develop hundreds of polyps at a young age; this patient does not need genetic testing for a somatic mutation in the APC gene. Patients with hereditary nonpolyposis colorectal cancer, with multiple polyps present, have an increased risk of endometrial cancer and develop colon cancer at a young age. It is unlikely that the blood loss from a small polyp would be sufficient to cause iron deficiency, although the small amount of blood emanating from colonic polyps and cancers is the rationale to test for fecal occult blood. Peutz-Jehgers syndrome is associated with development of hamartomatous polyps in the small intestine.

15. A. The figure shows a large villous adenoma. There is a high probability that large villous adenomas will progress to invasive adenocarcinoma. When they occur in the descending colon, these lesions are annular and cause obstruction. In the colon, non-Hodgkin lymphomas are far less common than adenocarcinomas, and they do not manifest as mucosal sessile masses. Carcinoid tumors are typically small and yellowish, and most grow slowly. Leiomyosarcomas are rare; they produce large bulky masses, but they do not arise on the mucosa. Mucinous cystadenomas are cystic and are more likely to arise in an ovary or in the pancreas. The original lesion in this patient was a villous adenoma.

16. A. This young patient's colon shows hundreds of polyps. This is most likely a case of familial adenomatous polyposis (FAP) syndrome, which results from inheritance of one mutant copy of the APC tumor-suppressor gene (a few FAP cases are associated with DNA mismatch repair genes). Every somatic cell of this patient most likely has one defective copy of the APC gene. Polyps are formed when the second copy of the APC gene is lost in many colon epithelial cells. Without treatment, colon cancers arise in 100% of these patients because of accumulation of additional mutations in one or more polyps, typically before 30 years of age. Patients with a gene for hereditary nonpolyposis colorectal carcinoma, such as MLH1 and MSH2, also have an inherited susceptibility to develop colon cancer, but in contrast to patients with FAP, they do not develop numerous polyps. Sporadic colon cancers may have CpG island hypermethylation along with KRAS mutations, whereas others have p53 mutations, but the somatic cells of patients with these cancers do not show abnormalities of these genes. NOD2 mutations are linked with Crohn's disease.

17. B. The lesion is an adenocarcinoma, showing irregular glands infiltrating the muscle layer. Such a lesion in a 30-year-old man strongly indicates a hereditary predisposition. One hereditary form of cancer is called hereditary nonpolyposis colorectal cancer (HNPCC) and results from defective DNA mismatch repair genes. As a result, mutations accumulate in microsatellite repeats (microsatellite instability) that lead to loss of transforming growth factor beta (TGF-β) receptor mediated control of colonic epithelial cell proliferation and loss of proapoptotic BAX protein enhancing survival of these transformed cells. He could have taken NSAIDs that inhibit COX-2 expressed in most colonic adenomas and carcinomas. In contrast to familial adenomatous polyposis syndrome, HNPCC does not lead to the development of hundreds of polyps in the colon. Detection of ERBB2 (HER2/NEU) expression is important in breast cancers. Germline inheritance of the tumor suppressor gene RB1 predisposes to retinoblastoma and osteosarcoma, not colon carcinoma. E-cadherin is required for intercellular adhesion; its levels are reduced, not increased, in carcinoma cells. Translocation of the retinoic acid receptor alpha gene is characteristic of acute promyelocytic leukemia.

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قال صلى الله عليه وسلم: {من سلك طريقًا يلتمس فيه علمًا سهَّل الله له بهِ طريقًا إلى الجنة}

دعواتنا لكم بالتوفيق