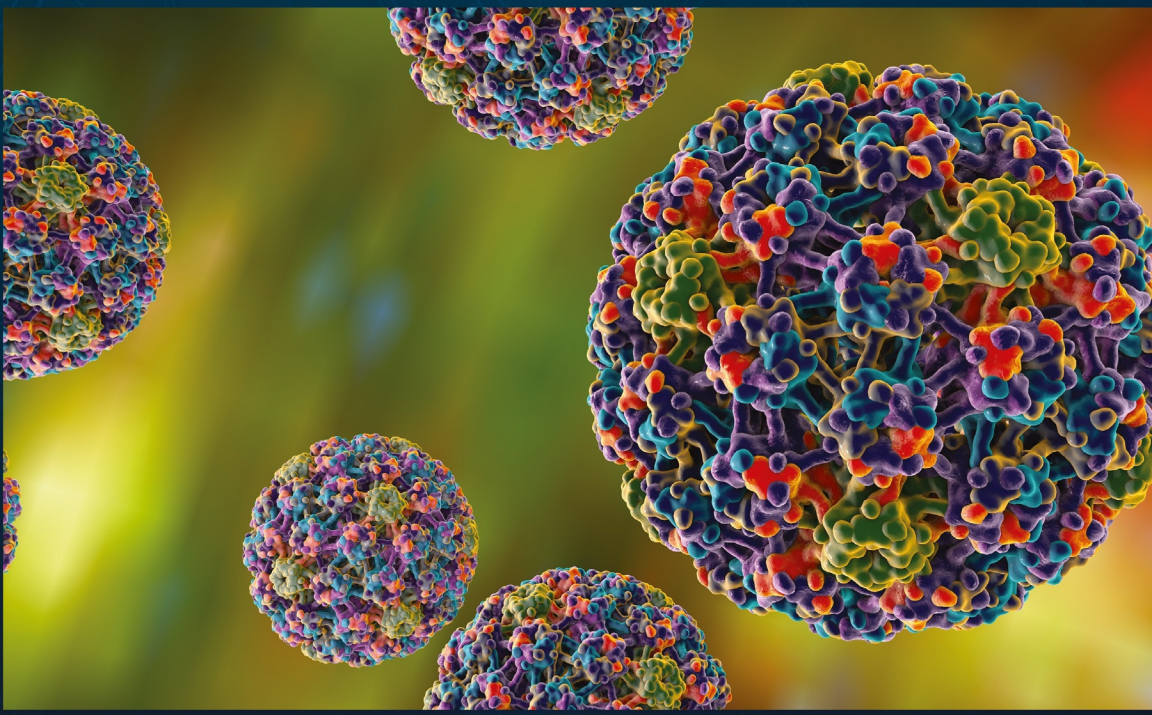
DEVELOPMENTS IN MICROBIOLOGY

IMMUNOPATHOLOGY, DIAGNOSIS, AND TREATMENT OF HPV-INDUCED MALIGNANCIES



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Contents

CHAPTER 10

Available immunotherapies and future opportunities to prevent HPV-associated cancers

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1. Introduction

Several forms of malignancies including cervix, vagina, vulva, head and neck, and penile are commonly associated with human papillomavirus (HPV) [1]. More than 100 HPV variants have been identified to date [2]. Of these, the most frequently encountered high-risk HPV (HR-HPV) variants (16, 18, 31, and 45) are together responsible for approximately 80% of cervical cancer (CC) cases [3–5]. Among several other variants, HPV-16 and -18 are considered as most pervasive HPV variants that are linked with an estimated 62.6% and 15.7% of several malignancies, respectively [6]. Intriguingly, these stated variants are responsible for $<85\%$ of vaginal and vulvar, $\sim 90\%$ of oropharyngeal, 93% of anal as well as $\sim 80\%$ of penile carcinomas [7]. HPV infection in women accounts for an alarming situation globally as its infection increases the risk of developing cancer [8], thus making HPV a current public health priority (Fig. 1). Approximately 291 million HPV-positive incidences were reported globally in 2007 [9]. In the women exhibiting homeostatic cytology of the cervix, the prevalence of HPV infection was 10.4% and 11.7% between 2007 and 2010, respectively. Ethnically, increased reports of HPV infection were reported in women belonging to Oceania (30.9%), Africa (slightly more than 20%), persuaded by Europe (14.2%), America (11.5%), and Asia (9.4%) [10,11]. Moreover, among the female population globally, 32.1% were reported to be the carriers of HPV infection in 2011 whereas the females belonging to Asia and Africa demonstrated higher prevalence of 45.5% and 29.6%, respectively [12].

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